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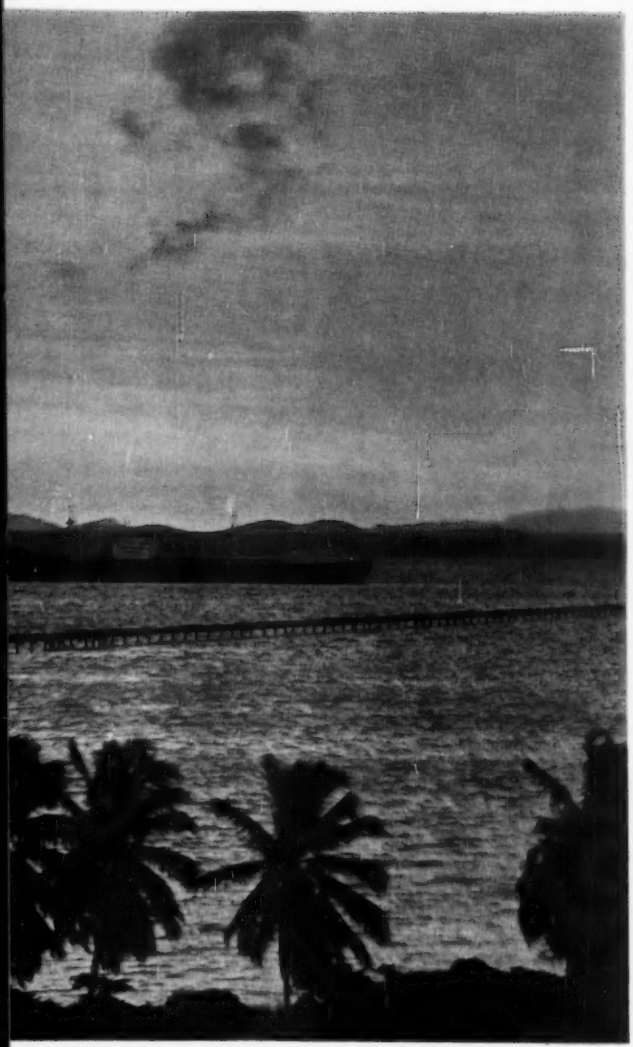
# Chemical Week



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March 7, 1959

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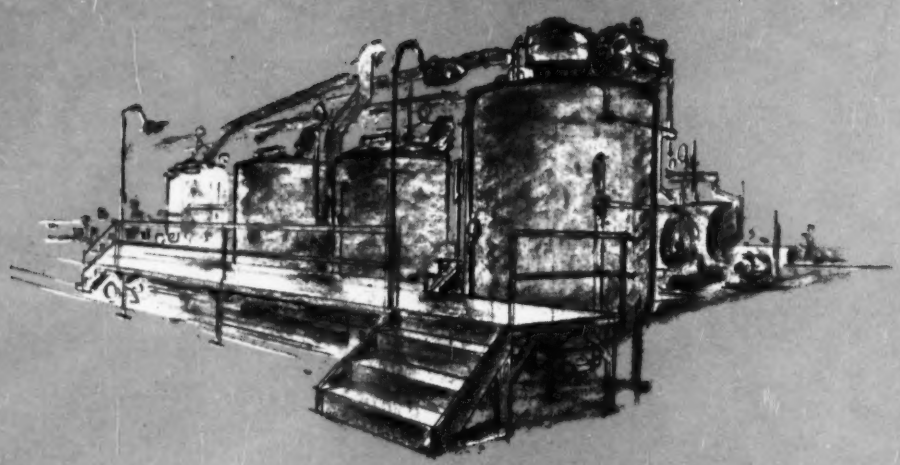

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Chemical Week

## TOP OF THE WEEK

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**No. 10**

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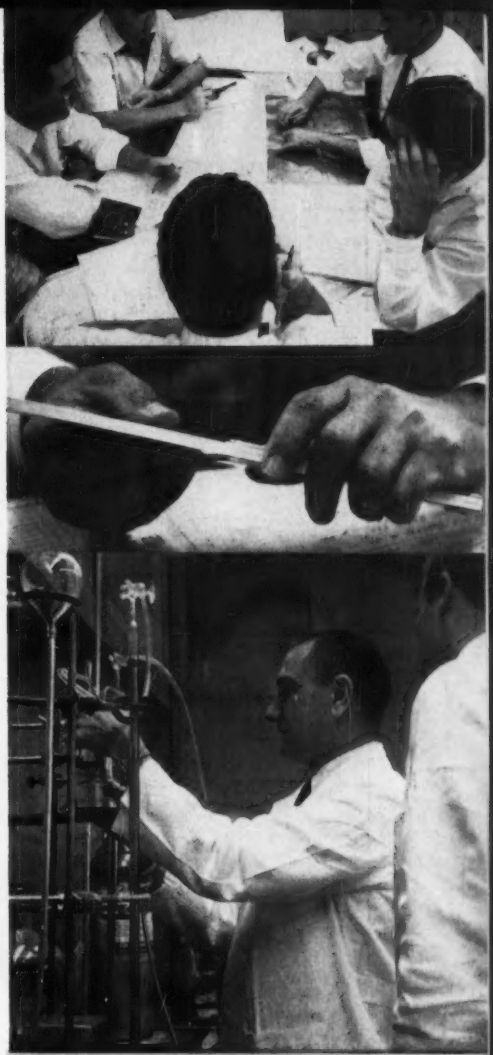

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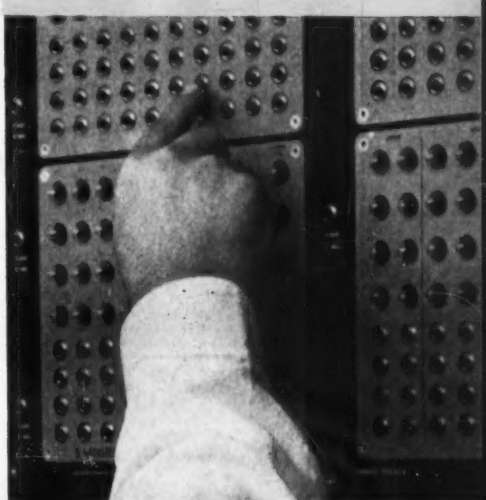

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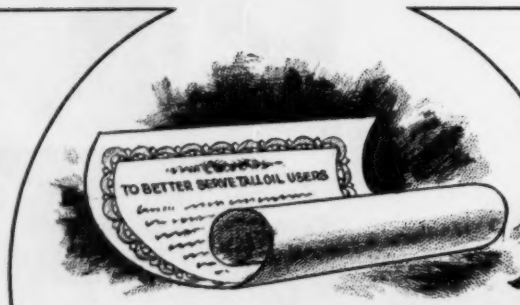


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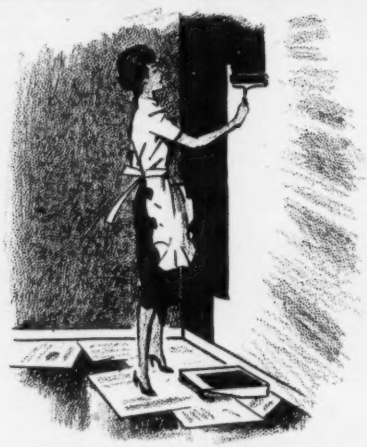

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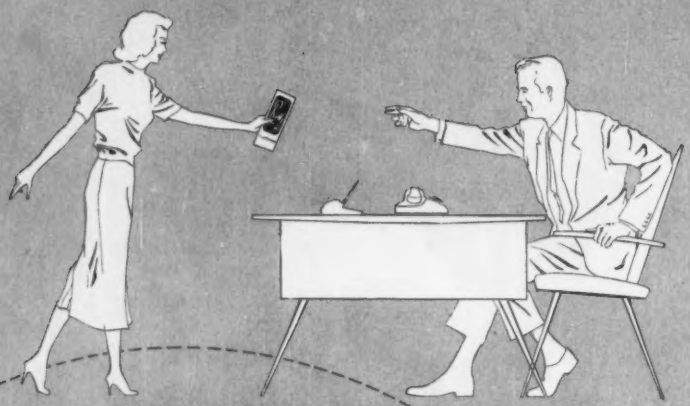

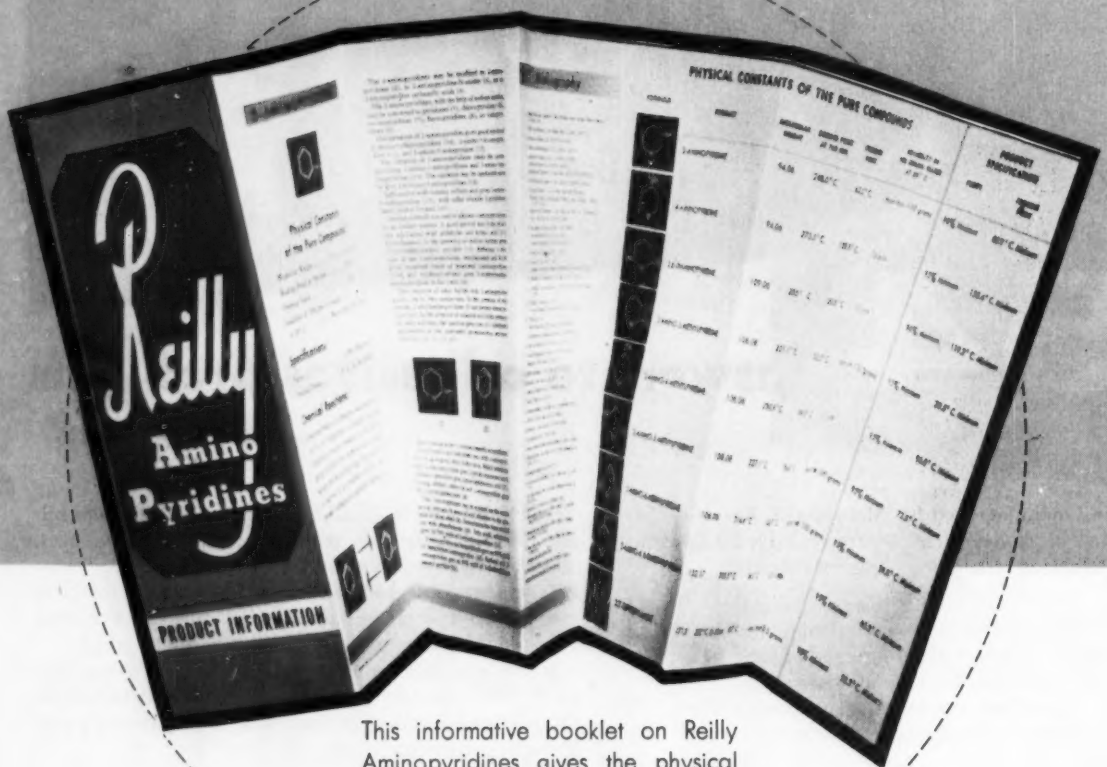


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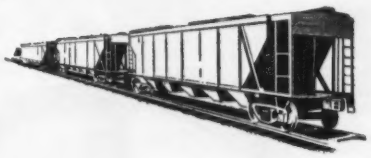

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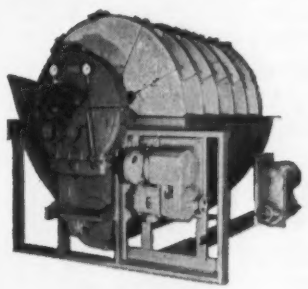

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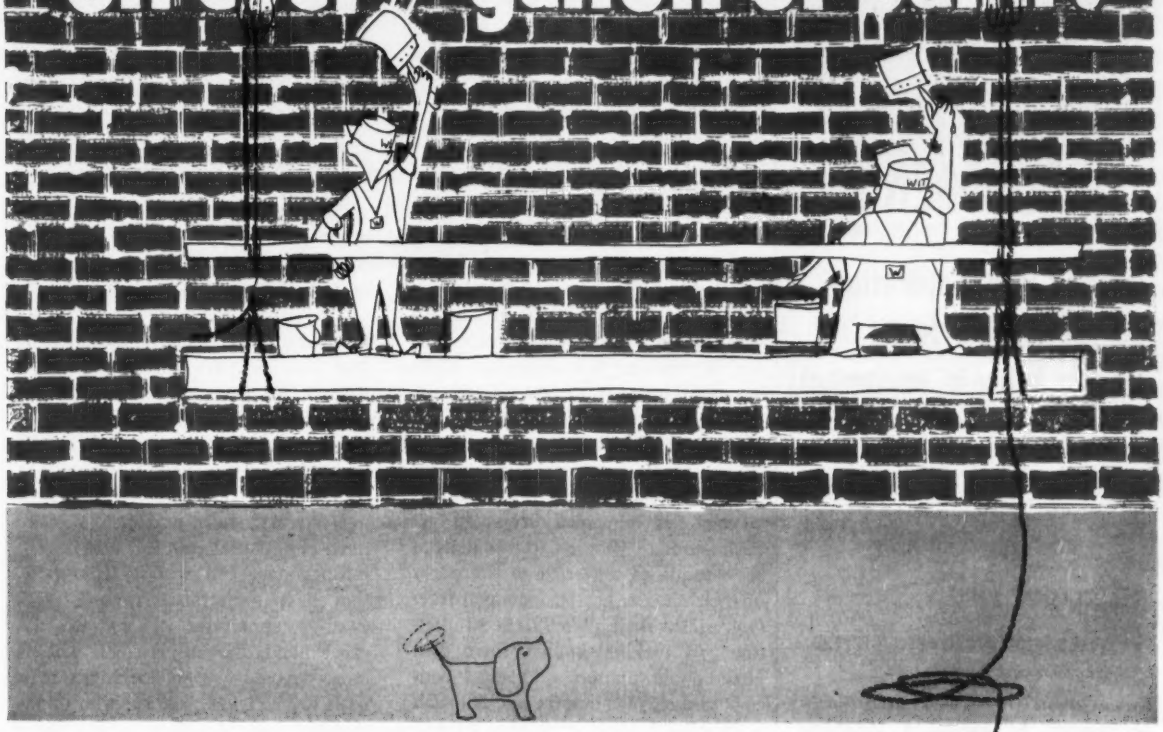

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# OPINION

## A Temperament for Politics

TO THE EDITOR: It is all to the good that CHEMICAL WEEK, in its Feb. 7 issue, raised the question of the businessman's proper role in politics. I say all to the good, if the discussion the question invites brings the nature of politics itself into clearer focus.

Politics, as I understand it, concerns itself with all aspects of communal life. [Why must] the proposed accent for the businessman be on such key areas as "pricing, antitrust, tariffs, regulation, labor"? . . . What about the need for schools? For adequate medical care? For decent housing? For national security? I am reluctant to believe that businessmen are indifferent to these needs. As a very practical matter, I know that they cannot be indifferent to them unless they intend to migrate entirely out of American life.

If they mean to retain their active citizenship, then the only kind of politics they can pursue is one that travels under the broad banner of citizenship, and not under the narrow banner of this and that company, seeking this and that narrow—if wholly legitimate—economic end. By all means, let businessmen step out in front and lead drives to get everyone registered in the party of his choice. Let him lead drives to get rank-and-file people to contribute such funds as they can to the party of their choice. Let businessmen freely exercise their own "right of petition" in making known their own views about matters of special concern to their own enterprises. All such actions are expressive of good citizenship.

But they defeat their purpose if the politics they pursue proceeds on the assumption that they are somehow a race apart from all other citizens, and a majority race at that. Viewed in terms of the total population, businessmen—as owners and managers—are in the minority. For that matter, every other interest, when viewed alongside of the total population, is also in a minority. We are, in fact, a nation of minorities. No one interest is large enough all by itself to form a majority, and thus to win control of the government and to manage it for its own ends. This simple, arithmetical fact explains why the tide of public opinion invariably runs against any one interest that pursues an egocentric policy to the exclusion of what the nation itself needs for its future life and growth as a nation.

It seems to me, therefore, that the real politics for businessmen to pursue lies well beyond what can be learned in a "kit" of materials put out by any company or association. It lies well beyond the decision of the kind of political statements plant managers should issue, the role to be played by the board chairman, the role to be played by the lower echelons, and so on. The politics for businessmen to pursue as individual citizens is the all-encompassing politics that is traditional in America. It is the politics of group diplomacy whose aim, achieved by discussion and compromise in which everyone gives a little and takes a little, is to reconcile the rival needs of many interests so that a majority consensus of some sort can be realized.

This is no airy-fairy statement of the matter. The demonstrable truth is that businessmen's temperament and wisdom for the politics of group diplomacy are recognizable to their fellow citizens across the country. In consequence, they have had the stout support of the laboring and the farming interests, fully as much as they have had the support of their fellow businessmen; and with that support, they have been raised to high elective or appointive offices. On the other hand, the businessman who is more devoted to rigid ideologies than he is to changing realities, who thinks that his material success makes him a supreme judge of all things without hard study; he who is totally absorbed with the problems of self to the exclusion of the problems of others—this sort of businessman is rarely rewarded with the trust of public office, and if he gets it by chance, he doesn't hold it very long. The reason he doesn't is because he is altogether alien to the ruling spirit of the great mass of Americans—whose suffrage he needs if he is to get anywhere in politics.

JOSEPH M. BAIRD
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New York

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*Easy to Carry ... Easy to Pour*

FIELD REPORT

TO: B.D.

RE: [redacted] Handle Order

Showed Mr. [redacted] our new Side Handle Bag...some of his customers had already mentioned it to him. He saw great benefits for both his dealers and their customers. He immediately recognized that it would be helpful in opening new distribution and getting more merchandising cooperation from dealers. Showed him our strength tests and the heavy abuse our handle could take. Got the order. Left him our Sales Promotion and Dealer Aid kit which he said would be useful to his Sales and Advertising Department. He plans a big promotion built around this sales "extra".

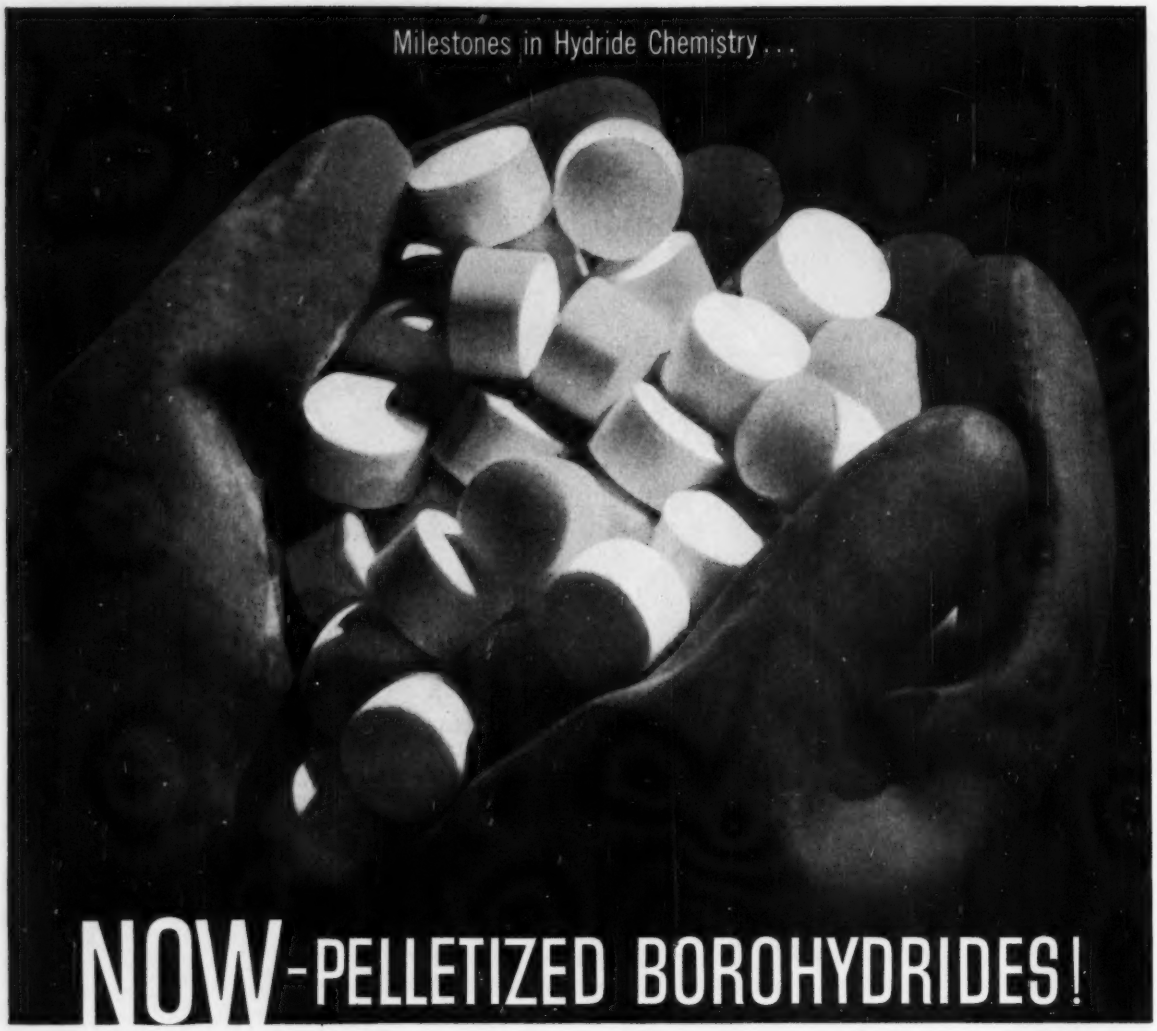
*Hudson Bags increase your sales — cut your costs!*

**HUDSON MULTIWALLS**

*for further information write:*

**HUDSON PULP & PAPER CORP.**
477 Madison Avenue • New York 22, N. Y.

Plants at Pine Bluff, Ark. • Palatka, Fla. • Wellsburg, W. Va.




## For continuous fixed-bed, in-stream carbonyl group and peroxide reductions

High purity MHI sodium borohydride and MHI potassium borohydride are now available in smooth, cornerless pellets. Simplifying handling and eliminating dust, the new pelleted borohydrides open applications in fixed-bed purification to remove carbonyl or peroxides from gaseous or liquid olefins, diolefins, alcohols and glycols, amines and aminoalcohols, ethers and polyethers, acrylonitrile and chlorinated hydrocarbons.

Sizes of the new pellets are 10/32″ and 24/32″ in diameter. Bulk density averages five pounds to the gallon. The pellets are hard and resist crushing or dusting. Further information and technical service is yours without obligation. Write, wire, or phone today!

**New, too! $NaBH_4$-SWS** Write for complete details concerning MHI Sodium Borohydride SWS — the new stabilized water solution form that cuts the price of $NaBH_4$ more than in half!

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**Metal Hydrides Incorporated**
PIONEERS IN HYDRIDE CHEMISTRY
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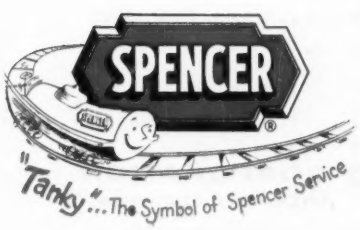
# "Wait there's more...it says... 'Spencer Service Is Wonderful'!"

Write for your free copy of Spencer Chemical Company's new 16-page Nitric Acid Booklet.

## NEED NITRIC ACID?...

**You can be sure of** getting fast, dependable nitric acid service when you contact Spencer Chemical Company. Spencer produces nitric acid in four specific gravities—36°, 38°, 40°, and 42° Baumé. Get the complete facts by writing for Spencer's new Nitric Acid Booklet. A copy will be sent you without obligation.




## SPENCER CHEMICAL COMPANY

*America's Growing Name in Chemicals*

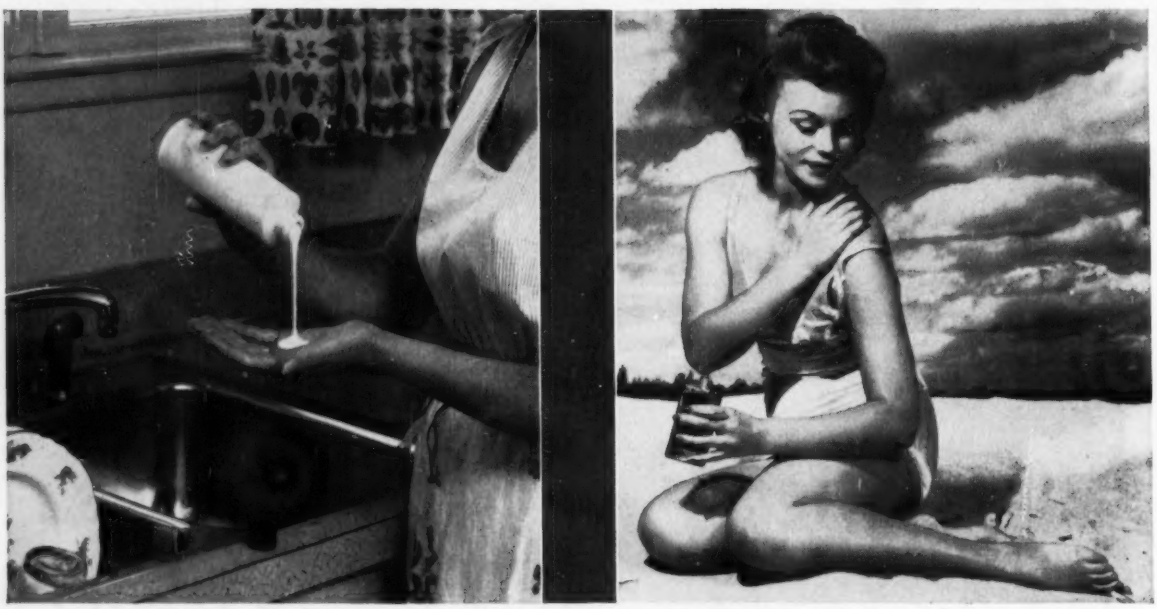
**SPENCER PRODUCTS:** Ammonia (Commercial, Refrigeration and Metal Treating Grades) • Aqua Ammonia • 83% Ammonium Nitrate Solution • Prilled Ammonium Nitrate • Methanol • Formaldehyde • FREZALL (Spencer Dry Ice) • Liquid $CO_2$ • Cylinder Ammonia • Nitric Acid • "Poly-Eth" Polyethylene • Spencer Nylon • "Mr. N" Ammonium Nitrate Fertilizer • SPENSOL GREEEN and URA-GREEEN (Spencer Nitrogen Solutions) • SPEN-AMM (Spencer Anhydrous Ammonia)

**GENERAL OFFICES:** Dwight Bldg., Kansas City 5, Missouri

**DISTRICT SALES OFFICES:** 500 Fifth Avenue, New York City; First National Bank Bldg., Chicago, Illinois; Candler Bldg., Atlanta, Georgia; 2158 Union Avenue Bldg., Memphis, Tennessee

# put "protect-appeal" in cosmetics

## WITH DOW CORNING SILICONE FLUIDS



At work or at play, women like the protection of silicones in creams and lotions.

### WATER-REPELLENT . . . LONGER-LASTING

Dow Corning silicone fluids help cosmetics soothe and smooth. Their water-repellency adds longer effectiveness and prevents many irritants from reaching the skin. In addition, silicones do not turn rancid, are unaffected by heat or cold, and leave a pleasant non-greasy feel. Dow Corning silicone fluids developed for cosmetics and toiletries provide an unusual combination of properties that enables you to make good products better — increase sales. These fluids are already being included in hand creams, sun-tan lotions, baby powders, hairsprays and many other items. Future applications are virtually unlimited . . . how about your product?

### YOUR BEST SOURCE FOR ALL SILICONES . . . DOW CORNING

Adhesives, defoamers, lubricants, cosmetic and polish additives, electrical varnishes, paint resins, intermediates, Silastic® (silicone rubber), Sight Savers®, paper coatings, laminating resins, water repellents, and release agents.

These and many other Dow Corning Silicones are cutting costs for industry . . . and are helping to make good products better. For more information, call the branch office nearest you or write direct to Dow Corning, Dept. 3315.

When you consider the entire cost, silicones cost less.

first in silicones

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ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

# Business Newsletter

CHEMICAL WEEK
March 7, 1959

**Look at the foreign scene:**

**A U.S. partner for an Argentine Chemical enterprise** is being sought by SOMISA, Argentine steel producer, seeking an outlet for coke-oven by-products. The company plans to build three blast furnaces; the first will start up late this year, the second in '62 and the third is slated for construction within 10 years. Prospective output from each furnace would yield 7,900 metric tons/year of ammonium sulfate, 1,640 metric tons of crude naphthalene, 4,900 metric tons of benzene, plus other derivatives.

**More major U.S. investments in Australia's chemical industry** are in the works. They could total $70 million—in addition to the $50-million petrochemical venture recently launched (*CW, Feb. 14, p. 24*). Chemical Construction Co. ( New York) and Power & Gas Corp., a British company, are drafting plans to build a large ammonium sulfate plant at Rockhampton, Queensland. American Smelting and Refining's Isa Mines Ltd. is weighing the advisability of building a zinc smelter plant at Townsville. At least two other U.S. mining companies are reported to be considering major projects.

**Mexico's petrochemical plans moved a big step closer** to fulfillment this week. Four U.S. banks signed a $40-million loan agreement with Pemex, the Mexican government's oil monopoly, which plans to build and operate much of the country's petrochemical industry. The new funds will finance pipe purchases for the long-projected 500-mile gas line from Pemex's refineries in southern Mexico to Mexico City. This loan is an outgrowth of the $20-million loan, announced several months ago but never signed.

While he's in the U.S. this week, Pemex President Pasqual Gutierrez Roldan (*CW, Dec. 20, '58, p. 22*) will be talking petrochemicals with several U.S. companies. On his agenda: explanatory talks with Fluor, Arthur G. McKee, and Foster Wheeler about engineering help for three proposed anhydrous ammonia plants. Last week, five European banks granted Pemex a $15-million credit to buy equipment for these plants from European manufacturers (*CW Business Newsletter, Feb. 28*). Additional orders for equipment, as well as engineering, may go to U.S. companies, Roldan told *CW*.

**From London, there's word that flexible plastic barges** are making their first commercial voyages—and finding buyers. In the Soviet Union, plans are under way for plastic-hulled river vessels.

Under development for several years, a 100-ft.-long nylon and rubber plastic sausage, towed by a 45-hp. launch, made its first commercial trip in England. It moved some 10,000 gal. of kerosene from a refinery to storage tanks 10 miles away. Barge maker Dracone Development Ltd. termed the voyage completely successful, proudly revealed that two barges have been ordered for use in West Africa.

**The Russian approach to cheaper vessels** calls for an experimental river freighter 107 ft. long with a 100-metric-ton cargo capacity. Its hull will be constructed from a two-layer plastic sheet, with foamed plastic between layers. Steel shapes, mainly to support the power plant, will comprise the frame, but plastic will be used as much as possible elsewhere.

•

**Du Pont attorneys won another important antitrust skirmish** with the government last week. The government sought to broaden its case for quick disposal of Du Pont's 23% interest in General Motors by introducing documents that allegedly showed GM was a favored customer.

But Federal Judge Walter LaBuy sustained a Du Pont objection that the documents were irrelevant. LaBuy did admit into evidence a general statement on Du Pont's trade relations with auto firms, which showed Du Pont sales to GM were higher than those to Ford and Chrysler.

•

**Late year-end earnings reports** tie up the loose ends of '58's financial package.

National Distillers' '58 after-tax net totaled $20.1 million, compared with $23 million in '57. Sales were $524.3 million vs. $538.5 million the previous year. President John Bierwirth reports polyethylene outstripped industrial alcohol, for the first time, as the company's biggest dollar-volume product (*see also p. 27*).

Foote Mineral's '58 sales dropped to $24.6 million, from $24.9 million in '57. Net income totaled $2.1 million, off 7%. Although cancellation of lithium stockpiling by the Atomic Energy Commission has hurt, Foote President L. G. Bliss predicts new industrial markets "will catch up to our production in 18 months to two years."

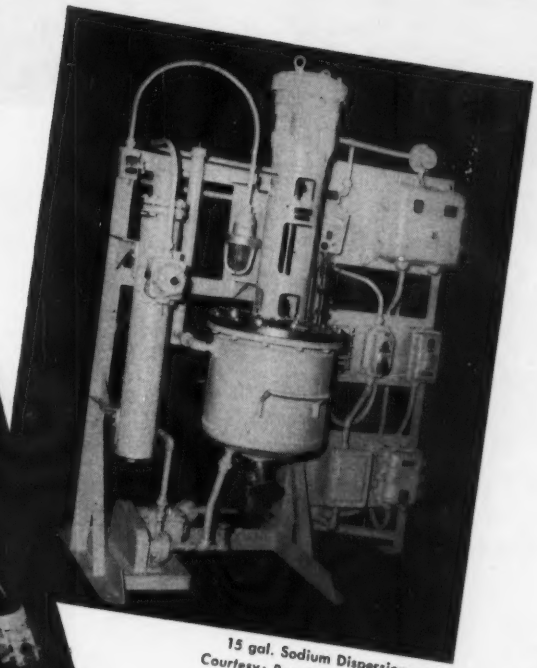
Victor Chemical posted sales of $52.6 million vs. '57's $52.2 million. But net earnings fell to $3.5 million, off 5.5%. So far in '59, Chairman August Kochs reports, "sales are slightly ahead of the corresponding date last year."

In the booming drug industry, American Home Products Corp. upped '58 earnings to $42.4 million, from $38.6 million in '57. Sales rose 5%, to $116.6 million.

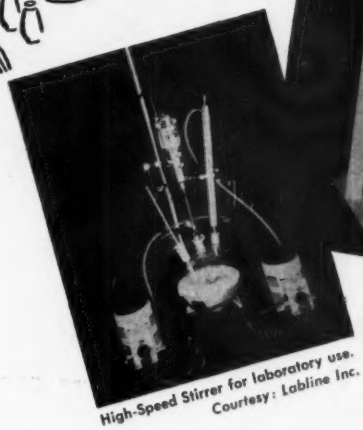
Abbott Laboratories chalked up the best earnings in its history, netted $12.9 million, compared with $12.7 million in '57. Sales were up 5%, to $116.6 million.

In its second fiscal quarter ended Dec. 31, International Minerals & Chemical boosted sales to $23.5 million, from $23.3 million in the comparable '57 period. But profits slumped to $739,000, down 19.8%.

Interchemical's year-end sales hit $109.5 million off slightly from '57's $109.8 million. But profits shot ahead to $4.7 million, up 19.3%. President H. B. Woodman attributes the gain to Interchemical's cost-cutting program, plus a second-half sales recovery.



15 gal. Sodium Dispersions unit.
Courtesy: Premier Mill Corporation.



High-Speed Stirrer for laboratory use.
Courtesy: Labline Inc.

# "do it yourself" sodium dispersions?

***Why not? With the modern equipment available, you can make your own dispersions and enjoy several outstanding advantages:***

1. You can make any quantity you desire.
2. You have closer control on adjusting particle size to your specific needs.
3. You reduce the tendency of dispersions to settle out, oxidize or agglomerate.
4. You make only the dispersions you want *when* you want them.

We'll be glad to send you all the facts on modern dispersion equipment and our booklet—USING "ETHYL" SODIUM IN DISPERSED FORM—which describes the preparation of dispersions for laboratory, plant or commercial use.

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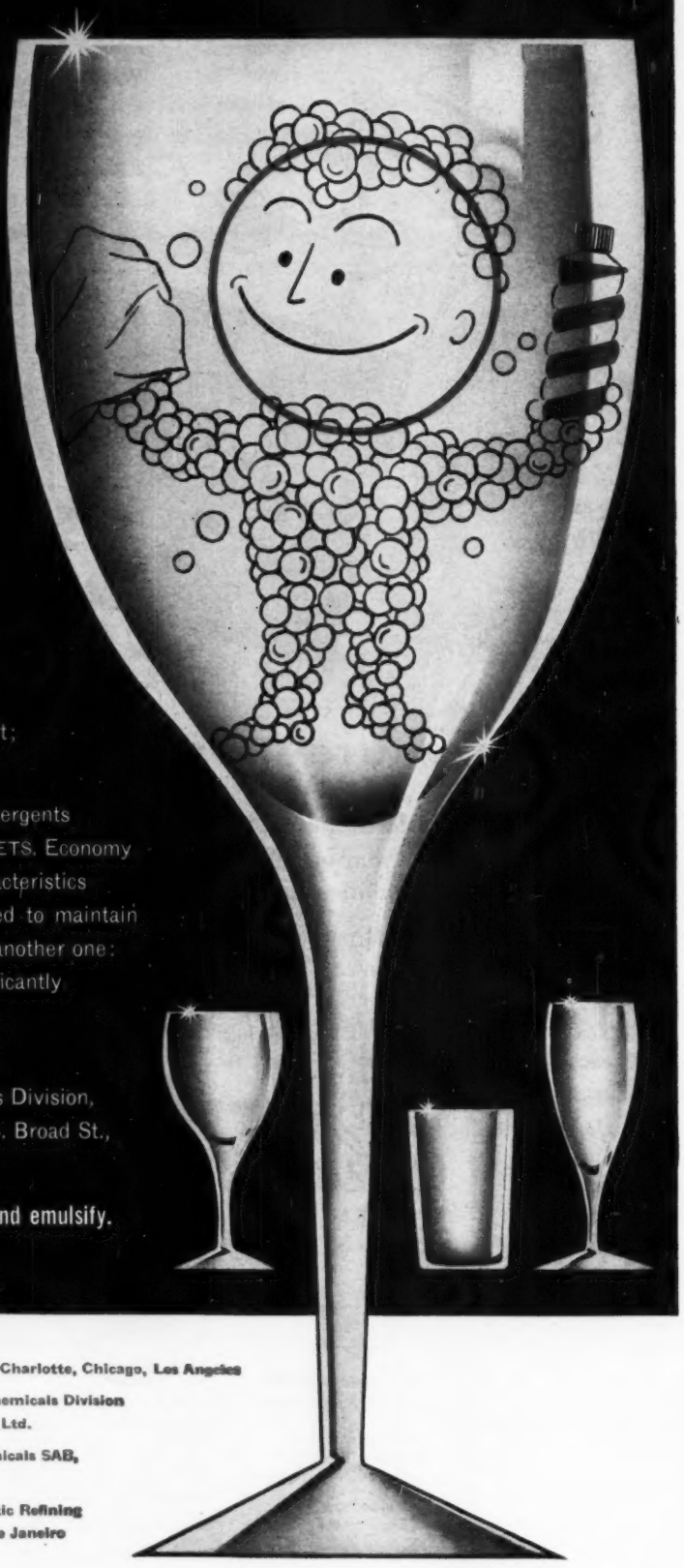
CW 3-7-59

# Suds, Shines and SELLS



The growing preference for liquid detergent formulations is showing up in the sales picture. Last year there was a phenomenal industry-wide increase in these sales.

And no wonder. Liquid detergent formulations offer real economy; instant solubility in any water; a pleasing fragrance; sneeze-free washing; dishes that dry shining bright; no sink scum to scrub away.

Many of today's best selling liquid detergents are formulated with Atlantic ULTRAWETS. Economy is one reason. High performance characteristics allow a saving on the quantity needed to maintain product efficiency. Add to this saving another one: you can buy the ULTRAWETS at significantly low prices in tank car or bulk lots.

Ask us for detailed information on the ULTRAWETS. Write or wire Chemicals Division, The Atlantic Refining Company, 260 S. Broad St., Philadelphia 1, Pennsylvania.

**The ULTRAWETS wet, penetrate, clean and emulsify.**

**ATLANTIC PETROLEUM CHEMICALS**

**Philadelphia, Providence, Charlotte, Chicago, Los Angeles**

**In Canada: Naugatuck Chemicals Division of Dominion Rubber Co., Ltd.**

**In Europe: Atlantic Chemicals SAB, Antwerp, Belgium**

**In South America: Atlantic Refining Company of Brazil, Rio de Janeiro**

*The editors of Chemical Week . . .*

*Editor-in-chief Howard C. E. Johnson and Editorial Director Sidney D. Kirkpatrick study designs for the new CW award.*

*. . . are proud to announce the first*

## Award for

# Chemical Management Achievement

On Tuesday, Dec. 1 of this year, the first CHEMICAL WEEK award for management achievement will be presented to a company in the chemical process industries.

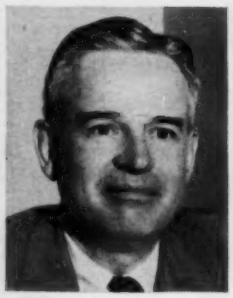
This new award recognizes chemical *management's* contribution, the vision and leadership that converts theory into profitable reality.

Who is eligible for the award? What is its purpose? Who will judge the nominations? And how does it differ from the *Chemical Engineering* award? These questions are answered on pages 22 and 24.

## *Members of the Chemical Week award committee*

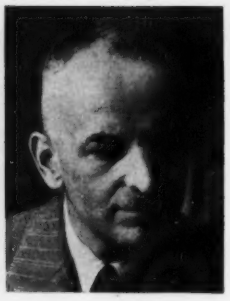
Richard B. Schneider

Roland P. Soule



Francis S. Williams

Robert Paul Brecht



Georges F. Doriot

Walter G. Whitman, *chairman of the award committee*

Hoke S. Simpson

H. B. Maynard

Robert F. Moore

Arthur J. Slade

**Purpose:** Unlike the *Chemical Engineering* achievement award—which recognizes outstanding engineering contributions — the CHEMICAL WEEK award will be granted for demonstration of outstanding management talent in some particular field.

Centralization or decentralization; integration or diversification through internal growth or acquisition; corporate or departmental reorganization; handling of debt or equity capital; commercial chemical development and marketing; employee, public or community relations—these are typical areas that will be combed for outstanding management action.

The award will be presented to a company, or division or department of a company, rather than to an individual. It will cover activities dating back to Jan. 1, 1954, and be presented coincidentally with the *Chemical Engineering* achievement award.

**The Judges:** An 11-member award committee has been selected from among leaders in finance, education and management. Chairman: Walter G. Whitman, of the Massachusetts Institute of Technology, with Sidney D. Kirkpatrick, editorial director of CHEMICAL WEEK and *Chemical Engineering*, serving as vice-chairman. Howard C. E. Johnson, editor-in-chief of CHEMICAL WEEK, will serve as secretary, without the right to vote. No committee member will render judgment on any organization he has served as employee, officer or consultant since Jan. 1, 1954.

The following will serve:

• *Richard B. Schneider,* vice-president and director, Empire Trust Co. He is a former assistant vice-president of W. R. Grace, and has been associated with Arthur D. Little, Allied Chemical and Du Pont.

• *Roland P. Soule,* vice-president, Irving Trust Co. Dr. Soule was formerly vice-president of the American Machine & Foundry Co., before which he was on the staff of the Tri-Continental Corp. and the International Coal Carbonization Co.

• *Francis S. Williams,* president and director of the Chemical Fund and a partner of F. Eberstadt & Co. He has been with Eberstadt since 1932, active in the management of Chemical Fund since its founding in 1938.

• *Robert Paul Brecht,* for many years chairman of the geography and industry department of the University of Pennsylvania's Wharton School of Finance and Commerce. Dr. Brecht, in addition to his teaching responsibilities, serves as an arbitrator and consultant.

• *Georges F. Doriot,* professor of industrial management at the Harvard Business School since 1929, and president and director of American Research & Development Corp. General Doriot is an officer or director of 15 corporations.

• *Hoke S. Simpson,* director of executive programs, Graduate School of Business, Columbia University. Mr. Simpson, before joining the Columbia staff, was director of personnel administration for Vick Chemical.

• *H. B. Maynard,* consultant. Dr. Maynard, following his association

# New ideas for paint... with EPOXIDE 201

## *One of 4 new diepoxides from CARBIDE research*

Fast acid reactivity is one of the major differences between Epoxide 201 and conventional epoxy resins. This new diepoxide can be used to cross link polymers containing free carboxyl groups or to reduce free acid content. In addition, Epoxide 201's low viscosity makes it easier to handle. Development quantities of Epoxide 201 are now available for your evaluation in epoxy, vinyl ester, acrylic, polyester, and alkyd resin coatings as well as for casting uses.

CARBIDE now offers four diepoxides for use in coatings and castings. In addition to Epoxide 201 you'll want to investigate these three other diepoxides—

***Dicyclopentadiene Dioxide***—is of particular interest for heat resistant plastics. For the first time in the epoxy resin industry—an easy-to-handle resin system yielding heat distortion temperatures in the range of 300° C., *even after long term heat aging.*

***Dipentene Dioxide***—has fast acid reactivity for cross linking. This, plus its economy, makes it of particular interest for coatings.

***Vinylcyclohexene Dioxide***—to effectively reduce epoxy resin viscosities without lowering heat distortion temperatures.

In evaluating these new diepoxides, talk to your CARBIDE Technical Representative. Ask him for copies of the two new research reports—"Resin Forming Reactions of Epoxide 201" and "High Temperature Epoxy Resins", along with a complete package of technical information on CARBIDE's diepoxides, or write to: Union Carbide Chemicals Company, Division of Union Carbide Corporation, Room 328, Department W, 30 East 42nd Street, New York 17, New York.

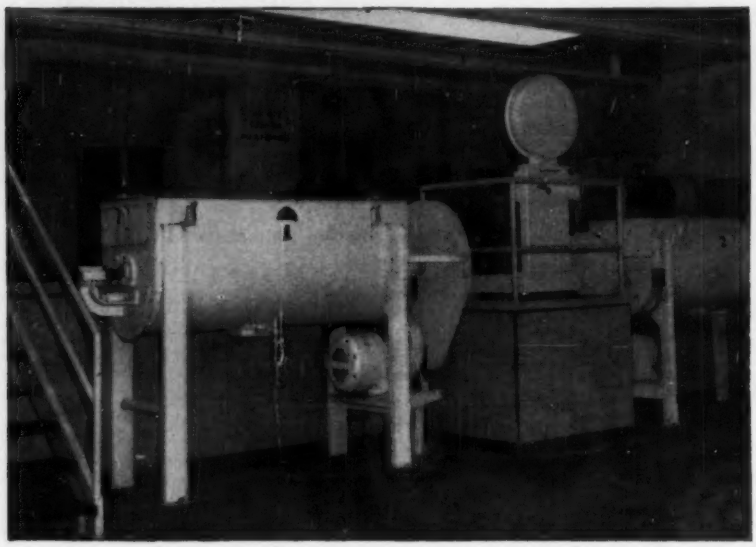
*"Union Carbide" is a registered trade mark of UCC.*

**UNION CARBIDE CHEMICALS COMPANY**

DIVISION OF UNION CARBIDE CORPORATION

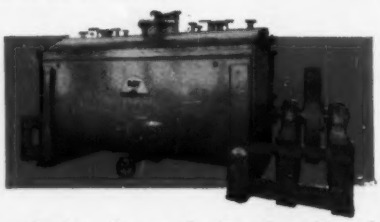
# DAY mixes
## in the best companies

**Fearn Foods Inc. is one of thousands of old friends. They've used DAY Ribbon Blenders for years in their Franklin Park, Illinois, plant.**



When the decision on what make of blenders to buy for their new modern Los Angeles plant came up, they just ordered three more DAY blenders. The reason — simply that DAY blenders have always given dependable trouble-free service. They operate smoothly, rapidly and efficiently. Their many features include outboard bearings that provide sturdy support for a solid alloy steel shaft. Stuffing boxes of sanitary seals for protecting bearings, prevent product contamination. They have a geared head motor, roller chain drive, galvanized or stainless tank, choice of agitators. Heating or cooling jackets optional. There is a complete line of DAY ribbon blenders available in capacities of 10 to 465 gal.

On the right is a DAY mixer from the Jumbo line. These rugged brutes are built for extra heavy loads. Capacities 600 to 3850 gal. Complete lab facilities available for testing your product.



**Join the many companies now enjoying the production benefits of DAY blenders and mixers. Write today for Bulletin 800.**

*The* **J. H. DAY** *Co.*

*Division of The Cleveland Automatic Machine Co.*

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with Westinghouse Electric, formed the Methods Engineering Council in 1934. This organization, following merger with another consulting group, became H. B. Maynard & Co. in 1957.

• *Robert F. Moore,* vice-president of the consulting firm, Richardson, Bellows, Henry & Co. Mr. Moore has had a broad background in consulting—especially in the areas of organization planning and management development.

• *Arthur J. Slade,* managing partner, Rogers, Slade & Hill, consultants. Mr. Slade, following a diversified business career in Canada and the U.S., has been a consultant since 1939.

**Measures of Achievement:** How can management performance be measured? The obvious yardsticks are financial—an improved balance sheet, an improved profit-and-loss statement, a high ratio of earnings to sales, capital appreciation of common stock. But financial performance need not be the only criterion. Demonstrable gains for employees, customers, industry, or the public at large, may be deemed equally worthy.

The award-winning achievement may well recognize research and development, engineering or production, but it will likely involve contributions from many staff and line departments —all coordinated and potentiated by top management.

The award will recognize, emphasize and honor the role of top management in welding the diverse elements of a corporate entity into a harmonious and forward-moving whole.

**Nominations:** Nominations for this award may be made both by companies, for their own activities, or by individuals, who wish to direct attention to companies and industrial groups. All nominations, from whatever source, must be received by the secretary of the committee of award not later than April 15, 1959. Management of the companies so nominated will then be asked to file, by June 15, a brief statement outlining the nature and extent of achievements, and whatever supplementary records and data will be helpful to the committee.

Nominations, which will be held in confidence, should be addressed to Howard C. E. Johnson, Secretary, Committee of Award, 2400 McGraw-Hill Building, New York 36, N. Y.

# CHEMICAL HAULING MADE EASY... AND ECONOMICAL!

## *Fruehauf Tank Engineering Achieves Maximum Payload For Professional Acid Transporter Harold Waggoner & Co.*

PROCESSORS OF CHEMICALS are transferring more and more of their freight each year to the bulk Tank-Trailer method of shipping, for two financially important reasons: *speed and economy.*

Barrel handling is eliminated, routing delays are removed, inventories at destination can be reduced, and customer good will is increased wherever direct, rapid, efficient Trailer transport has been introduced. Scientific Trailer engineering by Fruehauf has produced specialized, high-capacity units capable of carrying practically any liquid or powdered chemical produced in America—safely and speedily.

Among the countless professional liquid haulers who rely on such Fruehauf equipment for dependable, profitable, efficient shipment is Harold Waggoner & Co., Granite City, Illinois. This firm's 15 Fruehauf Acid Transports were designed to carry maximum-size cargoes in 8 different states. Considering the variation in local weight laws, this is no mean engineering feat.

Waggoner hauls liquids from East St. Louis, Illinois, to the East Coast, and has operated Fruehaufs since 1954. Like most other specialized haulers, Waggoner finds Fruehauf Finance plans and nationwide service facilities helpful because they are geared to the hauling business. If you ship or transport a liquid chemical, you too will find it profitable to investigate Fruehauf Tank-Trailers.

*For Forty-Four Years—More Fruehauf Trailers On The Road Than Any Other Make!*

FRUEHAUF TRAILERS

*World's Largest Builder of Truck-Trailers*

**FRUEHAUF TRAILER COMPANY**

**10948 Harper Avenue • Detroit 32, Michigan**

**PLEASE SEND FULL FACTS, WITH NO OBLIGATION, ON FRUEHAUF CHEMICAL TRANSPORTS**

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU

## Nopco detergents insure important economies

. . . **IN TEXTILES** *they add important economies in wool scouring and carbonizing, cotton boil-off operations, and dyeing*

. . . **IN PAPER** *they keep felts clean—reduce shutdowns for cleaning equipment*

. . . **IN TANNING** *they are used in hair scouring and to remove excess hide grease*

. . . **IN ANY PRODUCT** *where a surface cleansing action is desired*

Nopco chemists are constantly spurred by the need for practical chemistry in industry—for new and better ways to overcome processing problems our customers face. The success of our business over the years has been built largely on their unfailing success in finding the exact answer. Why not let Nopco chemists have a try at your most urgent present problem—in the selection or use of detergents or anything else where practical chemistry can serve. Simply write or call our Technical Research Department. Nopco Chemical Company, 60 Park Place, Newark, N.J.

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NOPCO® **VITAL INGREDIENTS FOR VITAL INDUSTRIES**

Lubricants • Detergents • Sizes • Plasticizers
Softeners • Emulsifiers • Dispersing Agents
Wetting Agents • Defoamers • Thickeners

For complete information, see Chemical Materials Catalog, Page 378

HARRISON, N.J. • RICHMOND, CALIF. • CEDARTOWN, GA. • BOSTON, MASS. • CHICAGO, ILL. • LONDON, CANADA

Chemical Week
March 7, 1959

## *Entering the new year on an upbeat*

| | *Production Dec. '58* | *Change from Feb. '58* |
|---|---|---|
| Acrylonitrile | 20.5 million lbs. | up 97% |
| Polyester resins | 10.8 million lbs. | up 44% |
| Vinyl resins | 81.6 million lbs. | up 39% |
| Acetylene | 1.1 billion cu. ft. | up 36% |
| Polyethylene | 83.7 million lbs. | up 35% |
| Benzene | 29.7 million gals. | up 35% |
| Urea | 105.2 million lbs. | up 31% |
| Primary aluminum | 152.3 thousand tons | up 25% |
| Chlorine | 335.2 thousand tons | up 25% |
| Sulfuric acid | 1.5 million tons | up 21% |
| Manganese | 26.4 thousand tons* | up 9% |
| **Average chemical and allied products output** | | **up 8%** |
| Phthalic anhydride | 23.3 million lbs. | up 3% |
| Sodium | 9.0 thousand tons‡ | down 6% |
| Magnesium | 1.6 million lbs.† | down 54% |

* Nov. figure. † Shipments. ‡ Estimate.

**Sulfuric acid plant workers are upping output.►**

# Pegging Postrecession Pickup Pace

**Latest chemical production figures, out this week, show that certain tonnage products—such as sulfuric acid—are recovering faster than the industry as a whole from recession low points one year ago. Rates of recovery—or lack thereof—for these large-volume products (table, above) indicate which companies and divisions are in line for higher '59 earnings. Here are highlights on the more significant developments.**

Probably the most encouraging harbinger of a continued CPI sales surge is the pickup in sulfuric acid shipments. Just-released December figures show production hit 1,474,599 short tons, 21% higher than Feb. '58, when industry sales touched the year's low.

Behind the upturn is a surge in demand for steel, partly in anticipation of a summer strike. Other factors: the rayon industry's fast comeback and a pickup in agricultural chemicals. One big integrated fertilizer maker, for example, reports that sales of its newer products are up as much as 150%. Others have noticed an encouraging, but less spectacular, sales boost.

**Sulfur Shipments Rising:** The big Southwestern sulfur producers report that domestic shipments for January and February were up 25% over the same months in '58. Since sulfuric output correlates closely with sulfur production, another boost in acid output is seen for the first quarter.

Almost all types of plastic resins are also among the big gainers since February of last year. Producers don't see any spectacular new development influencing their sale, rather, it's continuing growth of plastics in packaging, structural and textile markets that will boost output.

During '59, polyurethanes may well show the biggest percentage gain. Production figures don't show up in any categories now compiled by government statisticians. But Mobay, one of the largest U.S. urethane makers, reports that total U.S. production in December hit a monthly peak of 5 million lbs. Total output last year was 25-40 million lbs.

**Expansion for Foams:** Nopco Chemical, another big urethane maker, is now installing equipment at its North Arlington, N.J., plant to provide for six times the facility's present urethane output (*CW, Feb. 28, p. 22*). The firm expects consumption to jump to 70 million lbs. this year. Mobay generally agrees with Nopco's forecast, says that biggest volume growth will be in the furniture industry, while biggest percentage gains will be in crash pads and cushioning for autos.

Among other commodities, acry-

lonitrile, which was irregularly higher for most of '58, had its sharpest rise in December, hitting 20.5 million lbs. Vastly increased interest in the acrylic fibers is behind the big gain—which is expected to continue on into the '60s. Additional units, like Sohio's big acrylonitrile unit now going up in Lima, O. (*CW Technology Newsletter, Feb. 14*), are expected to spring up.

And along with the acrylonitrile buildup comes a surge in acetylene usage. Production hit 1,074 million cu.ft. in December, up a whopping 36% from the Feb. '58 low point. Other acetylene boosters: increases in vinyl resin and synthetic rubber output.

**Slump in Metals:** But recent gains haven't been shared equally. Sodium output slumped to 8,546 tons in November, down 10% from February. December figures, to be released late this week, are expected to show little improvement. Sagging production is largely the result of a cutback in titanium production since mid-'57.

But another factor is dwindling production of tetraethyl lead. Refineries noted a decrease in over-all gasoline demands during the year, operated at less than capacity. In addition, they produced a greater percentage of naturally high-octane fuels. Thus, on both counts, sodium—used as an intermediate to make octane-raising TEL—lost ground.

Magnesium, too, was off sharply, down to 1.6 million lbs. in December vs. 3.5 million lbs. in February. The drop was largely due to closedown of several magnesium-process titanium plants and a cutback in aircraft procurement.

## State Tax Sticklers

**Corporation tax specialists were scrambling this week to find which—if any — of their companies' operations may be vulnerable under last week's U.S. Supreme Court decisions tending to broaden state taxation powers.**

These new rulings — giving states more leeway to collect taxes on companies' incomes and raw materials—appear to have considerable importance for CPI companies; most are largely engaged in interstate commerce, having plants, warehouses, sales offices, suppliers and customers in several or many states. In addition, many CPI companies use materials imported from other nations and turn out various products for export.

At this point, it's probably too early to size up the new decisions' full impact on the industry. Complicating the task: the great diversity in the companies' operations and the 49 states' tax laws. All but three state legislatures, moreover, are holding regular sessions this winter and spring —many will enact new tax laws and amendments.

**Getting on the List:** It appears that with respect to state income taxes, industrial concerns fall into two general categories:

- Some companies — usually the larger ones — make it a policy to register at the capital in each state, are thus on the state tax agencies' mailing lists.
- Other companies — particularly smaller firms — have not always bothered to register in states where their business is mainly limited to sales work. Not usually billed for state income taxes, they probably will be now.

**Split Decisions:** The federal Constitution generally is understood to bar states from levying any taxes that would impede interstate commerce; and in both cases, Justice Felix Frankfurter protested that the high court's majority was departing from that principle. The majority's view is that the new decisions simply remove out-of-state companies from a favored status.

Essence of the income tax decision: a state can tax the profits earned within that state by an out-of-state firm, even if it is engaged exclusively in interstate commerce.

In the other case, the Supreme Court ruled that a state can levy a personal property tax on raw materials brought into the state and being stored for processing or fabricating. Previously, it was commonly considered that such materials could not be taxed until they were processed or converted.

Chemical companies queried by *CW* late last week weren't sure how they would be affected, wanted first to study the full texts of the decisions. Several state governments told *CW* they are already collecting these taxes; others said they will now move swiftly to "collect every penny we can."

## New Color Law Push

**Industry representatives met with officials of the Food and Drug Administration last week to discuss recent FDA test findings that seven widely used coal-tar colors are "toxic" under present laws. Possibility that their use may be banned has spurred a new cry for realistic codes.**

The accused—D and C Reds 9, 10, 19 and 33; Oranges 5 and 17; Yellow 7—are used primarily in lipstick, less often in hand lotions, capsule coatings, and liquid medicines. For many producers, the colors serve as a trademark. If they are banned, the producers will face a major scramble for substitutes—if any safe and virtually identical colors exist.

One industry complaint: while FDA toxicity tests normally take two years, the latest ones took 90 days. But in that time, says FDA, it had ample evidence that the colors may cause anemia, loss of weight and even death when taken internally in sufficient dosages. FDA decided there was no point in delaying action. Industry representatives maintain that the short-term tests are not conclusive enough to warrant action that could disrupt the industry.

**Time for Change?** Actually, there is no evidence that the minute quantities normally consumed can cause harm. But under the present law, coal-tar colors must be absolutely harmless, regardless of how much is taken internally.

Both industry and government men agree that a law such as the recently passed food additives bill, allowing safe tolerances, would protect the public without harming industry.

It would, in fact, probably be even safer, because under present law, once a color is certified as "safe," it may be used in any quantity. This could prove more harmful than restricted use of some "toxic" colors.

Karl Bambach, executive secretary of the Pharmaceutical Manufacturers Assn., asserts: "The recent Supreme Court interpretation of the coal-tar law means these colors have to be less harmful than salt and pepper."

For the present, producers using the seven colors do not face an immediate emergency. Any proposed ban would require prior public hearings. In the meantime, there should be no trouble getting new legislation.

## Latest Year-end Reports: *More 'Ups' Than 'Downs'*

(dollar figures in millions)

| *Company* | *'58 Sales* | *Change from '57* | *'58 Earnings* | *Change from '57* | *'58 Profit Margin* |
|---|---|---|---|---|---|
| Baxter Labs. | $ 25.1 | Up 5% | $ 1.4 | Up 31% | 5.6% |
| Borden Co. | 915.0 | Down 1.7% | 24.6 | Up 2.6% | 2.7% |
| Commercial Solvents | 64.7 | Down 1.8% | 1.4 | Down 2.1% | 2.2% |
| Eastman (1) | 828.8 | Up 3.7% | 98.9 | Up 0.8% | 12.0% |
| Foote Mineral | 24.6 | Down 1.4% | 2.1 | Down 6.8% | 8.8% |
| Merck | 206.6 | Up 10.5% | 27.7 | Up 19.9% | 13.4% |
| National Lead | 457.6 | Down 14.5% | 44.7 | Down 20.5% | 9.8% |
| Olin Mathieson | 601.4 | Up 1.4% | 9.4(2) | Down 76.2%(2) | 5.6%(3) |
| Reichhold (4) | 74.1 | Up 13.4% | 2.4(5) | Up 6.9%(5) | 3.3% |
| Smith-Douglass (6) | 16.2 | Up 16.1% | 0.9 | Up 200% | 5.3% |
| United Carbon | 56.5 | Down 4.7% | 5.6 | Down 10.5% | 9.9% |

(1) U.S. establishments; (2) including nonrecurring items—$5 million credits, $29.1 million debits; (3) based on net operating income, exclusive of above nonrecurring items; (4) revised; (5) excluding nonrecurring credits both years; (6) for six months ended Dec. 31.

# Clues to Bigger Dividends

**Larger cash dividend payments by chemical companies are in prospect this year. Foretelling a possible record outlay for dividends during '59 are these developments of the past week:**

• Significant all-industry increases in cash dividend payments in January —compared with Jan. '58 totals — were reported by the U.S. Dept. of Commerce: by chemical companies, up 4.7%, to $30.9 million; by oil refining firms, up 16.7%, to $4.2 million; and by all U.S. companies, up 2.5%, to $873.7 million.

• New York Stock Exchange figures strongly indicate that many larger chemical companies will be under stockholder pressure to raise dividends this year.

• Additional data on the scope and strength of the continuing upswing in chemical sales and earnings are revealed in year-end financial reports still trickling in from CPI companies (*table, above*).

The Commerce Dept.'s figures are by no means conclusive. The volume of dividend payments in January and February is traditionally light. Most first-quarter dividend checks are mailed out in March, so the first big test of '59 dividend trends is now in the making. Nevertheless, the $21-million increase in all publicly reported cash dividend payments in January certainly can be regarded as a straw in the wind.

**'Big Board' Companies' Cutbacks:** The New York Stock Exchange reports that among its listed companies chemical producers tended to be more generous to stockholders than most other firms. Of the 89 listed concerns classified as chemicals, 34 (38.2%) increased their annual dividend outlays during '58; 32 (35.9%) kept dividends at '57 levels; 19 (21.1%) reduced them; and the other four (4.5%) did not pay any. Among all 1,086 listed companies, 29.2% raised dividends; 37.8% stood pat on '57 rates; 24.8% cut dividends; and the other 11.5% paid none in '58.

Over-all, however, '58 dividend payments by the listed chemical companies declined 1.4%, to $1.016 billion, while the gross payout by all of the "Big Board" companies dipped only 1%, to $8.711 billion.

Now that chemical sales, earnings and profit margins are showing substantial improvements over last year's dismal first quarter, look for dividend-boosting pressure from many chemical company share-owners — particularly those of the 19 firms that cut back dividends last year.

**Hinting at Restoration:** One of those 19 companies—Olin Mathieson Chemical — has now tantalized its stockholders by issuing a year-end statement strongly hinting at the possibility that the higher '57 dividend rates might be reinstated this year. Says OM management: "Given a sound economic climate, we look forward to substantially improved profits in '59."

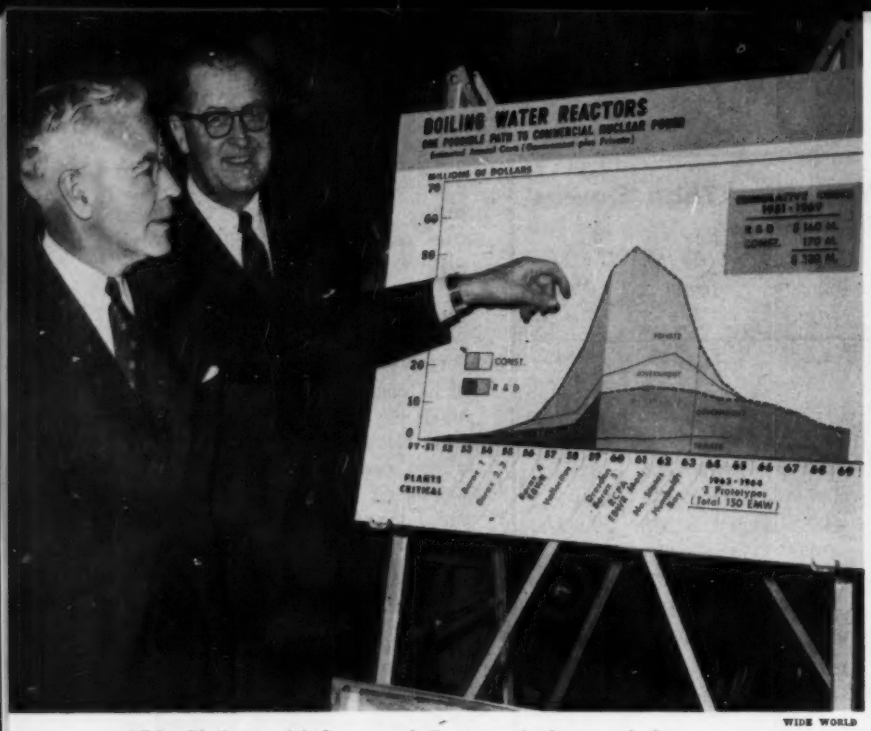
OM now details the fiscal effects of its sweeping expansion and spinoff programs during the past recession year. Net operating profits of $33.5 million were "drastically reduced" by writing off $29.1 million in "unusual and nonrecurring charges" — such as a $12.7-million startup loss on new aluminum facilities coming into production during the year, and $10.3 million in preoperating charges for various new plant projects. However, these debit items were partly offset by a $5-million net capital gain on sale of "a large number of unrelated or obsolete assets or those lacking profit potential." OM warns stockholders to expect further, though lighter, startup losses during the first half of '59.

**No Cutback for Carbide:** Union Carbide — which maintained its '57 dividend payout level of $108.3 million and still carried on a $144-million expansion program — also brought out its annual report last week. Carbide also is whetting stockholders' dividend appetites: management says the outlook for '59 is for continued improvement in sales and for increased earnings, and that its construction expenditures this year will likely be approximately equal to '58's.

Among Carbide's principal operating groups, chemicals and plastics both achieved 3% sales increases last year, now account for 32% and 22%, respectively, of company sales. Sales of industrial gases and calcium carbide rose slightly to 15% of the total, while shipments of metals and electrodes, carbons and batteries dropped to 19% and 12%, respectively.

Eastman Kodak—which increased cash dividends last year and has announced another boost this year, along with a one-for-one stock distribution — says higher sales totals for chemicals and fibers in '58 helped the company exceed '57 sales and earnings levels, despite a falloff in some of Kodak's older product lines.

National Lead also reports a '58 rise in sales of chemicals but a drop in shipments of its nonchemical products.



WIDE WORLD

AEC Chairman McCone and Senator Anderson clash over rate of development and role of government in nuclear work. ConEd's Fairman (right) wants 'fuel merchant' to supply reactor material and take by-products.

# Industry in Middle as Atom Feud Rages

**CPI concerns with atomic interests see new signs this week of more government help in developing a commercial nuclear industry.**

As the Congressional Joint Committee on Atomic Energy wound up its annual hearings in Washington on progress of the nuclear industry, Atomic Energy Commission Chairman John McCone laid out the Administration's reactor development program. But the plan has already been criticized by key committee Democrats as "pitifully inadequate."

McCone would have the AEC program aim at achieving nuclear power in areas of high power costs in the U.S. within 10 years; in half that time in friendly nations burdened with expensive power.

**Aiming at Quick Results:** To meet these objectives, says the AEC chief, efforts will be concentrated on those reactors that offer the greatest short-range promise—namely, the "light-water" cooled, organic-cooled and gas-cooled types.

As success nears with these, emphasis would shift to other concepts that may offer more long-range promise. These would include heavy water- and liquid metal-cooled reactors, and breeder reactors.

McCone, in a major switch in administration policy, also called for new laws to authorize AEC subsidies for reactor construction. AEC would provide as much as half the cost of a nuclear power plant. Until now, AEC aid has been limited to research and developments grants and free use of special materials.

**Big Jobs for Industry:** But McCone would limit these grants to so-called prototype reactors—that is, pilot plants that precede construction of commercial-size reactors. He would leave construction of the big commercial plants entirely up to private enterprise.

Here's where key Democrats such as committee Chairman Clinton Anderson (D., N.M.) feels the AEC plan falls short. Anderson says AEC should pay all the cost of the prototypes if necessary, without waiting for industry partners. He also favors capital subsidies to private companies for the commercial plants.

And even sharper Democratic reaction is shaping up against AEC's proposed authorization bill for '60.

**'Fuel Merchants' Wanted:** The AEC program doesn't come to grips with the specific problem of encouraging a commercial fuel reprocessing industry, but, at the hearing, private industry voiced some novel views on the fuel subject.

James Fairman of Consolidated Edison Co. of New York evoked interested response among committee Democrats when he commented:

"From the utility company viewpoint, what I would like to see eventually is a program under which we could turn over to a 'fuel merchant' the whole problem of supplying fuel to our plant and taking the by-products from it."

The government, Fairman went on to suggest, might consider a demonstration developing a plan for a reprocessing plant to handle one type of spent fuel, carry it clear through to construction of a prototype plant. This would be owned and operated by a chemical processing firm.

Chairman Anderson told Fairman the committee "has a great deal of sympathy" for the proposal.

**Heat for Processing:** Another witness—Michigan Chemical Corp. President Theodore Marvin—suggested a demonstration program to show the feasibility of using nuclear reactors as heat source for chemical or other industrial plants (*CW Technology Newsletter, Feb. 28*).

## COMPANIES

**Eastman Kodak's** directors have recommended several changes in the company's equity structure: a common-stock split, a switch in outstanding preferred, and authorization of 50 million additional shares of common stock. The one-for-one split (*CW Business Newsletter, Feb. 28)* would increase common shares outstanding to 38.4 million. On this, the directors declared a quarterly dividend of 37¢/share, equal to 74¢/share before splitting. Regular dividends have been 65¢/share. To reduce Kodak's capital, the board wants to let holders of preferred stock turn in each of their shares for $180 or two shares of a new preferred issue. Dividend on each pair of the new shares would be $7.20, compared with the current $6/share dividend.

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**Monsanto Chemical Co.,** to raise money for further expansion, is selling its eight-story Lion Oil Building (El Dorado, Ark.) and other property in Arkansas and Mississippi. It will continue to use the building for its Lion Oil division's general offices under lease from the new owner. Monsanto now has a big expansion program under way at the El Dorado refinery, including a new 5,000-bbls./day propane deasphalter, a new propylene tetramer unit, and additional crude throughput capacity.

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**Goodyear Tire & Rubber Co.** will increase authorized common stock from 15 million to 40 million shares, if stockholders approve at the April 6 annual meeting.

## EXPANSION

**Intermediates:** Du Pont's Explosives Dept. will put up "a small commercial unit" at its Repauno Works (Gibbstown, N. J.) to produce pyromellitic acid (PMA) and pyromellitic dianhydride (PMDA). The plant is due onstream by the end of '59. The new intermediates are suggested for use in plastics and synthetic lubricant production.

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**Petroleum:** Gulf Oil is launching engineering studies in Charleston, S.C., for a proposed refinery that would cost "somewhat more than $100 million" and have a capacity of at least 50,000 bbls./day. The refinery would process imported crude; accordingly, the decision to go ahead with the project will hinge on whether companies will be permitted to boost oil imports.

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**Lime:** Gibsonburg Lime Products Co. (Gibsonburg, O.) plans to expand and diversify its markets. It is installing an additional 240-tons/day dolomitic lime kiln, other production and storage equipment.

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**Nuclear Equipment:** Nuclear-Chicago Corp., producer of radiochemicals, radioactivity measuring instruments, and other equipment, is building a new home office in Des Plaines, Ill.

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**Polyethylene Bags:** Polycraft Bag Co. (South Bend, Ind.) is putting up a plant expressly to make heavy-duty polyethylene bags for packaging industrial and agricultural products. Initial capacity: 12 million bags/year. Production is slated to start this spring.

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**Tires:** A heavy increase in tire demand has prompted Gates Rubber Co. to step up the construction pace of its $18-million Nashville plant. The new startup date: Sept. 1—four months ahead of the original target.

## FOREIGN

**Pharmaceuticals/South Africa:** Merck's Merck Sharp & Dohme International Division will set up manufacturing operations in Johannesburg through its local subsidiary. First stage of the building program will be a plant to produce a selected line of pharmaceuticals, and finish and pack bulk drugs imported from the U.S.

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**Expansion/Europe** Dow has formed a Swiss subsidiary—Dow Chemie Aktiengesellschaft—in Basel, Switzerland, to finance Dow's "expanding interests overseas, especially in the European Economic Community." Capitalization: $5.8 million.

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**Chemicals/Chile:** Industria Azucarera Nacional, Chilean beet sugar producer, plans to market several by-product industrial chemicals this year, including some 250,000 gal. of ethyl alcohol, and ethyl and butyl acetates, acetone, butanol.

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**Rayon/Mexico:** Holland's big fiber producer, Algemeene Kunstzijde Unie (AKU), will provide technical know-how for rayon textile and tire-yarn production to Mexico's Cellulosa y Derivados (Monterey).

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**Textile Chemicals/Netherlands:** Tanatex Chemical Corp. (Kearny, N.J.) has opened a plant in Laren to produce processing chemicals for western European textile dyers and finishers.

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**Petrochemicals/Italy:** Montecatini is finishing construction of what will be one of Europe's biggest petrochemical plants in the Brindisi port zone. It's due onstream early March, will process 1 million tons/year of liquid hydrocarbons, including a full range of derivatives. Estimated cost: $80-95 million.

•

**Petrochemicals/India:** The Indian government is drawing up plans for a petrochemical complex to ring its Barauni refinery, which is slated to go onstream in '61. Products would include fertilizer, carbon black, synthetic rubber and plastics.

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The food processing industry takes advantage of aluminum's other important features. Because it looks clean, is easily kept clean, and imparts no color or flavor to the product, aluminum is the best choice for pans, churns and vessels. These aluminum containers also have high heat conductivity . . . an important consideration where heat must be applied to the product.

The brewing and pharmaceutical industries use aluminum for still another reason. Here, process equipment must be nontoxic to micro-organisms. That's why aluminum pasteurizers and other equipment are specified for fermentation reactions in microbiological processes.

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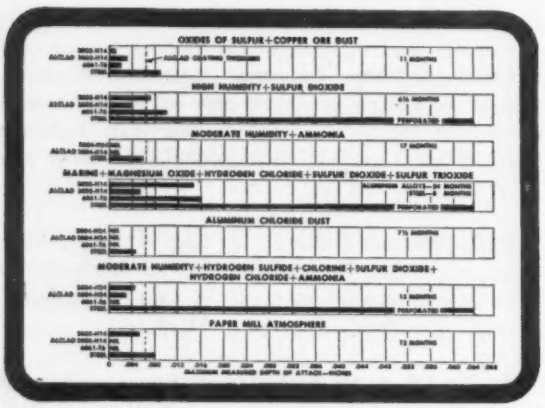
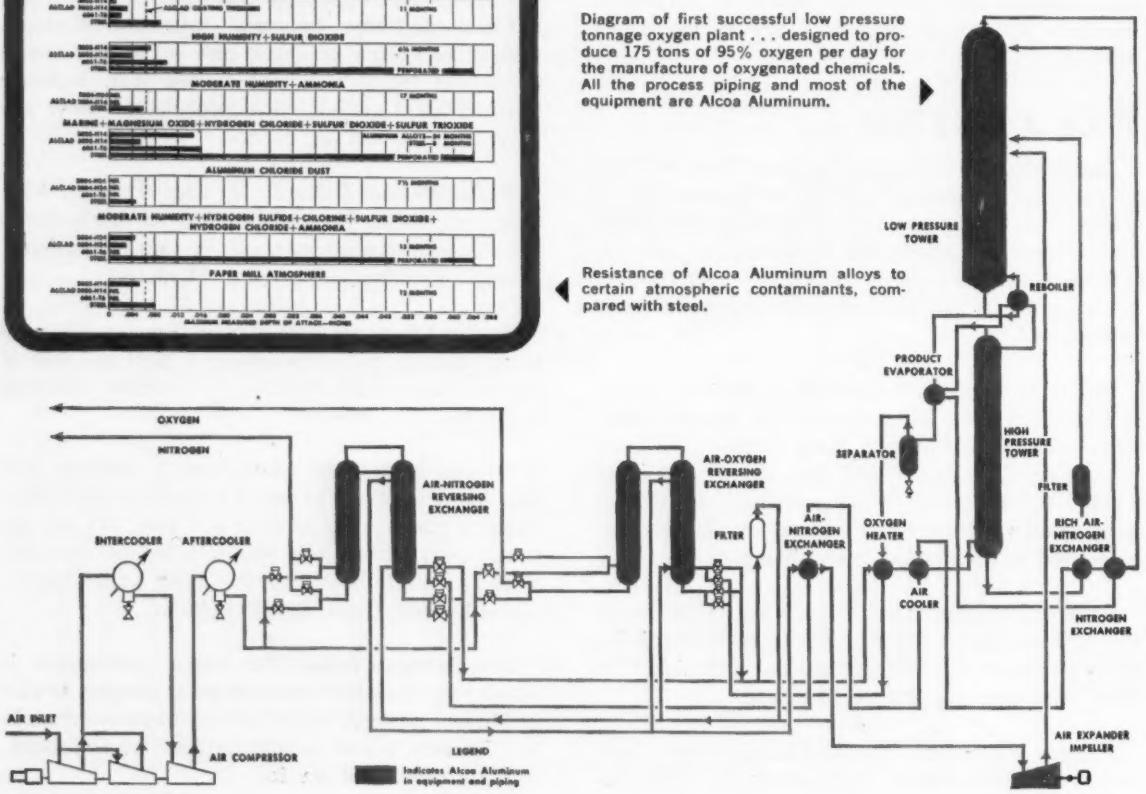
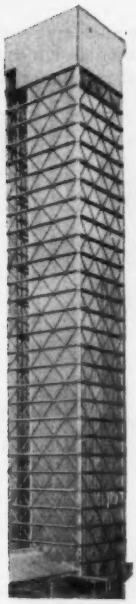

OXIDES OF SULFUR + COPPER ORE DUST
HIGH HUMIDITY + SULFUR DIOXIDE
MODERATE HUMIDITY + AMMONIA
MARINE + MAGNESIUM OXIDE + HYDROGEN CHLORIDE + SULFUR DIOXIDE + SULFUR TRIOXIDE
ALUMINUM CHLORIDE DUST
MODERATE HUMIDITY + HYDROGEN SULFIDE + CHLORINE + SULFUR DIOXIDE + HYDROGEN CHLORIDE + AMMONIA
PAPER MILL ATMOSPHERE

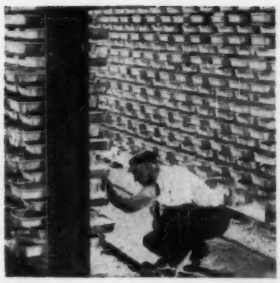
Resistance of Alcoa Aluminum alloys to certain atmospheric contaminants, compared with steel.

Diagram of first successful low pressure tonnage oxygen plant . . . designed to produce 175 tons of 95% oxygen per day for the manufacture of oxygenated chemicals. All the process piping and most of the equipment are Alcoa Aluminum.

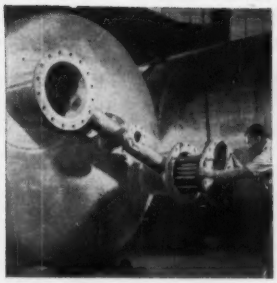




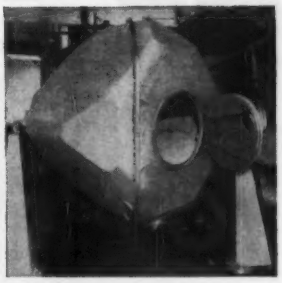
An aluminum prilling tower, 260 ft high by 40 ft square, used in the manufacture of solid ammonium nitrate. Auxiliary buildings are also covered with aluminum because of the corrosive atmospheres present.



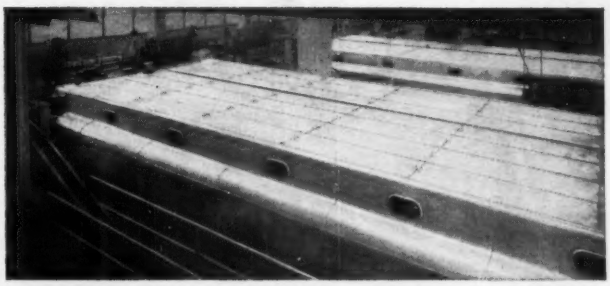
Aluminum solidification pans and molds for solids such as stearic acid and waxes resist corrosion and do not discolor the product.



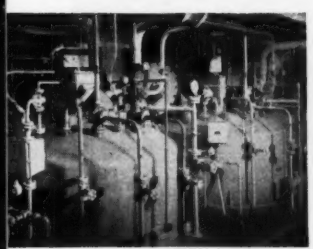
The naval stores industry uses aluminum to protect color and quality of rosin, rosin derivatives, turpentine and similar pine products.



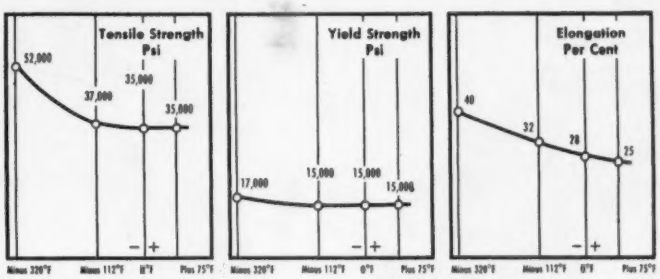
Butter has little tendency to adhere to the cast aluminum surface of this churn.



The sanitary appearance of aluminum covers and siding over these brewery pasteurizers is easily maintained.



These 3,000-gal aluminum adsorption tanks are used in the production of antibiotics. Aluminum distribution systems for acetone and deionized water also are shown.




Alcoa Alloy 5154-O is used extensively in process equipment, especially for cryogenic applications. The graphs above show how this alloy's physical properties actually improve at low temperatures. At minus 320 degrees F it improves 50% in tensile strength, over 13% in yield strength and approximately 60% in elongation.

Large scrubber tower for solvent recovery in a synthetic textile plant.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- ☐ 10270—Alcoa Utilitube
- ☐ 10460—Process Industries Applications of Alcoa Aluminum
- ☐ DD508—Aluminum Alloys in Tank Trucks and Tank Trailers
- ☐ 10387—Alcoa Standard Storage Tanks
- ☐ 20849—Resistance of Aluminum Alloys to Weathering and Resistance of Aluminum Alloys to Chemically Contaminated Atmospheres
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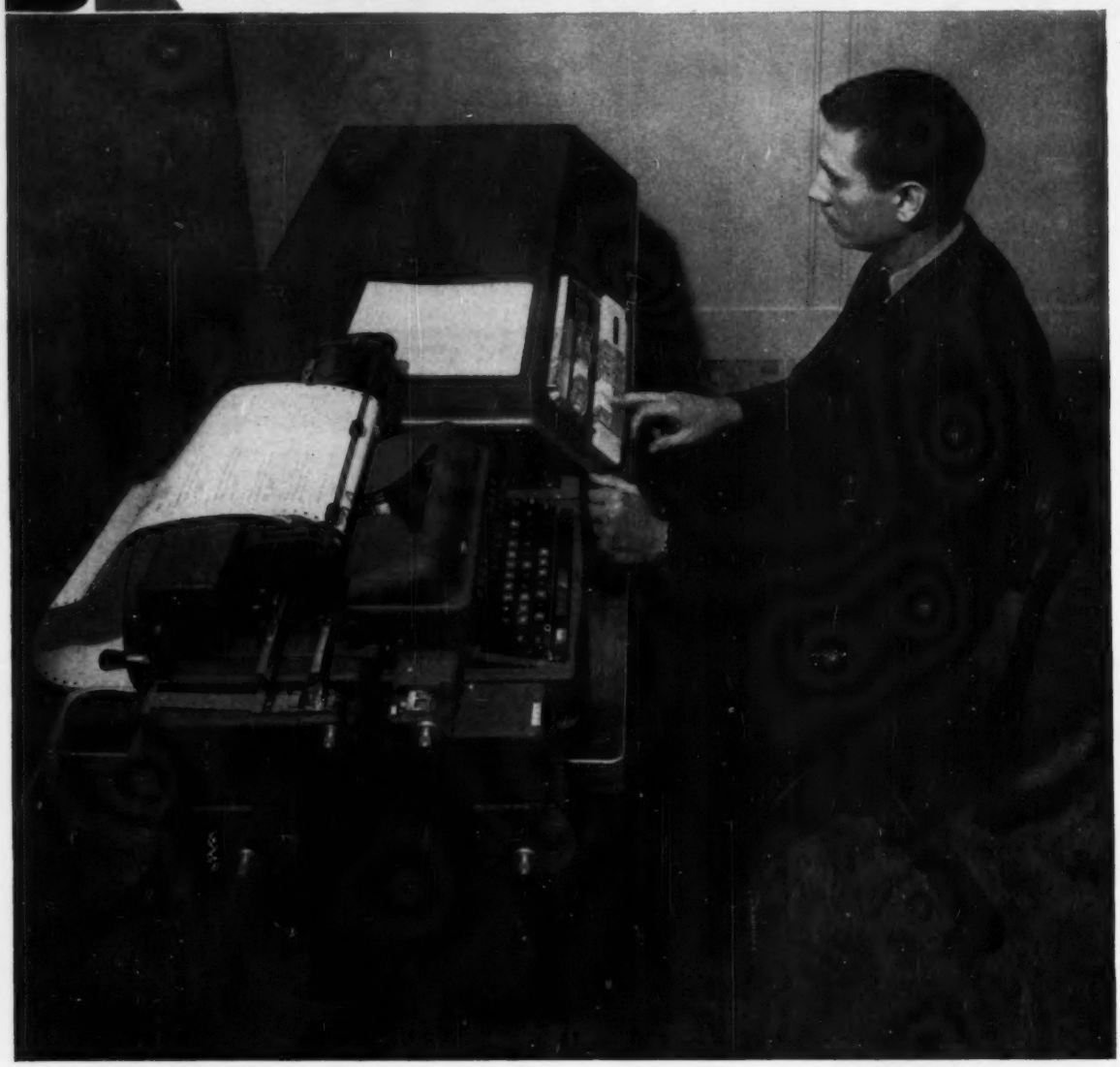

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# Washington
## Newsletter

CHEMICAL WEEK
March 7, 1959

**Go easy in exchanging medical information with Russia,** warns Merck's John T. Connor. He told a Senate committee last week that Russia is using public health aid as a weapon in the cold war. The U.S. should aim any international medical research at underdeveloped nations, he said.

Connor was testifying last week at a hearing on a bill by Sen. Lister Hill, chairman of the Labor and Public Welfare Committee, to set up a $50-million/year national institute for international medical research. The organization would not conduct research itself but would award grants and encourage international exchange of information and scientists.

A parade of federal health officials and private medical executives, including the president of the American Medical Assn., testified in support of the bill. Connor, however, warned that the U.S. is "way ahead of the Russians" in medical research and we should not "lightly trade away the important technical resources of our pharmaceutical and chemical industries."

As an example of Soviet penetration in the field, Connor cited his company's experience in India. Merck had set up a penicillin plant for the Indian government and was hesitating on a second plant for streptomycin because of the government-involvement angle. The Russians promptly offered to build a plant at their own expense—which spurred Merck's decision to go ahead.

The Senate is showing increasing warmth toward medical research in view of Senator Neuberger's and Secretary Dulles' current bouts with cancer. This bill is supported by 58 senators, and it is not even out of committee.

•

**Eisenhower is getting tougher with labor.** He hit rising wage costs twice in his press conference last week, with some of the bluntest language he's ever used. There were no cracks about the union bosses sunning themselves in Puerto Rico, such as he made a week earlier. But, in trying to block a new round of wage and price rises, he is plainly ready to keep the pressure on unions.

Eisenhower sees rising corporation profits as essential, warns against letting labor sop up all the gains of rising productivity. His point is that government needs are expanding and the way to pay for them is to spur the rise of profits—and tax revenues.

He went out of his way to take another shot at wage costs when asked about the purchase of a British-made steam turbine by TVA. Our costs are just too high, he told reporters. We can't compete at home, and we stand to lose our foreign trade, he said. The rising influence of Commerce Secy. Lewis Strauss is seen here—it's one of his favorite arguments.

## Washington Newsletter

(Continued)

**Fears of a round of price increases next year** just before the Presidential election haunt top policy makers in both parties. It's one of the reasons why both Republicans and Democrats are organizing broad studies of the causes of inflation. Vice-President Nixon heads the GOP investigation; Sen. Paul Douglas (D., Ill.) is in charge for the Democrats.

Lawmakers aren't waiting for the new studies to be completed. They are offering a rash of ideas about how to keep prices in check. Here are some that are being considered:

• Tighten up the laws against mergers. This is Sen. Estes Kefauver's suggestion. He argues that giant corporations have the power to raise prices even when demand is slack, and therefore contribute to inflation. Keep corporations small, this theory goes, and we'll have a more stable price level.

• Force big corporations to file notice of proposed price increases. This is backed by Sen. Joseph O'Mahoney (D., Wyo.). He would have corporations appear before the Federal Trade Commission to explain why they intend to raise prices. He would not give FTC power to block increases—just hold public hearings.

• Have the President's Council of Economic Advisors review major wage and price increases before they go into effect. This proposal, made by Rep. Henry Reuss (D., Wis.) and Sen. Joseph Clark (D., Pa.), is one of the few that mentions wage increases as a source of inflation.

Note that these are all Democratic proposals. Republicans are satisfied to amend the employment act to make stable prices, along with high employment, a goal of government action. This idea is being pushed by the Administration, though it may come up with other anti-inflation ideas next year when the Nixon committee finishes its work.

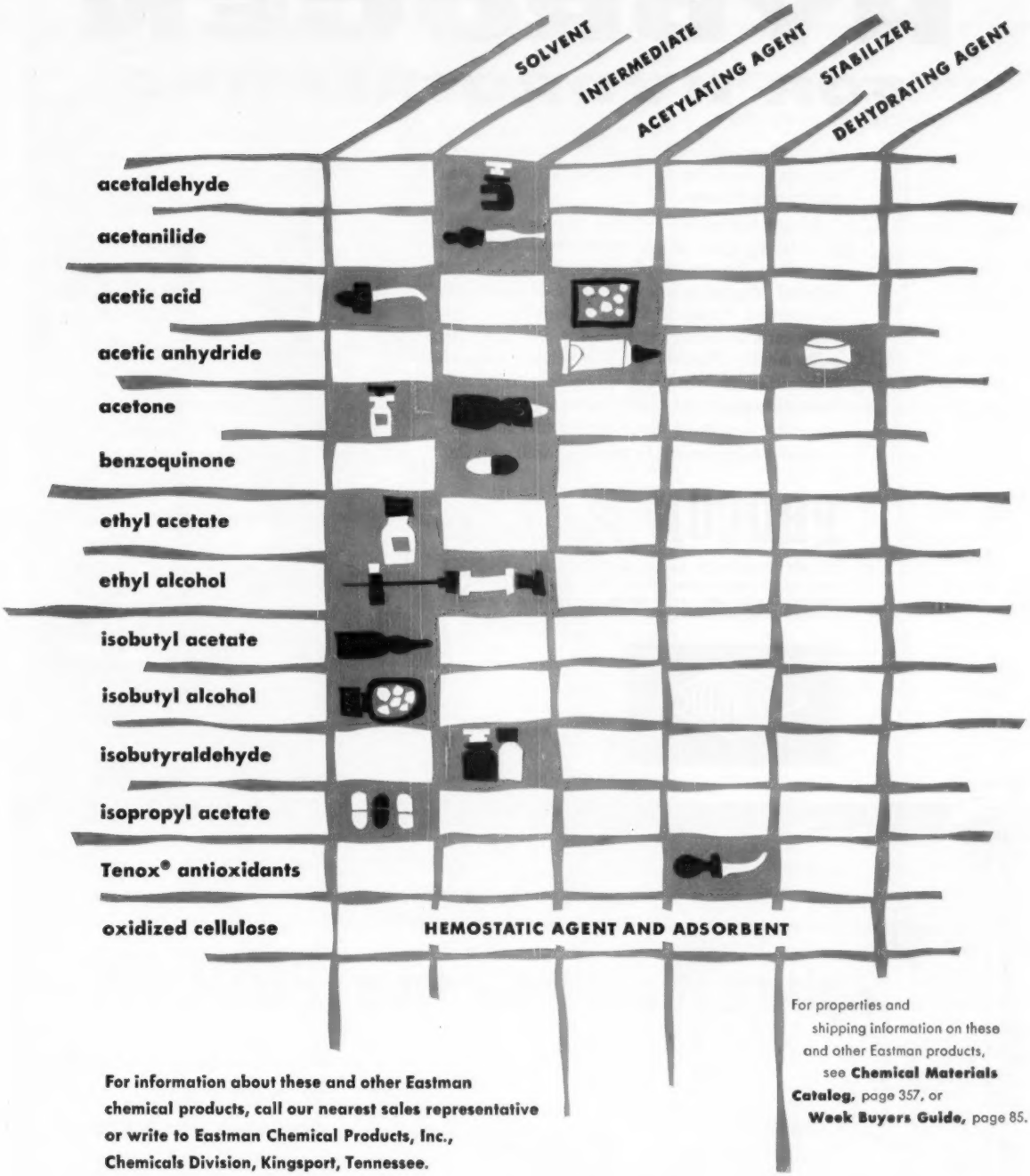
•

**Commerce Dept. will have a louder voice in U.S. foreign trade** policy councils after Lewis Strauss is firmly in the saddle. His appointment has run into some opposition on Capitol Hill. But Senate confirmation is almost certain.

In chemical industry circles, Strauss' trade views will be generally well-received. He will use his chairmanship of the influential Cabinet trade policy committee to advise tighter controls on exports to Communist bloc countries.

A battle of strong-men, between Strauss and Undersecretary of State C. Douglas Dillon, may result. Right now, Dillon won't make an issue of Strauss' views on East-West trade or Commerce Dept.'s role in trade policy. But Dillon will oppose Strauss if the latter becomes a spokesman for more import protection as the answer to the concern over U.S. exports pricing themselves out of world markets.

# Eastman raw materials for the Pharmaceutical industry

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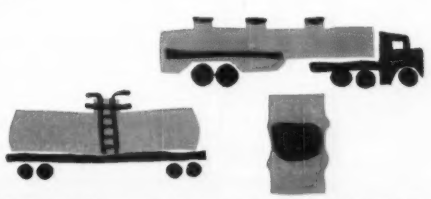

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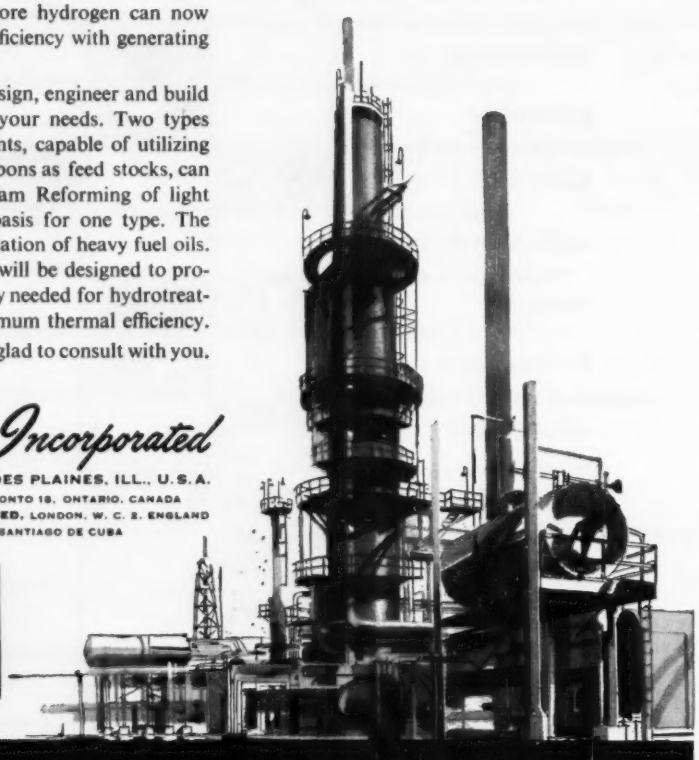

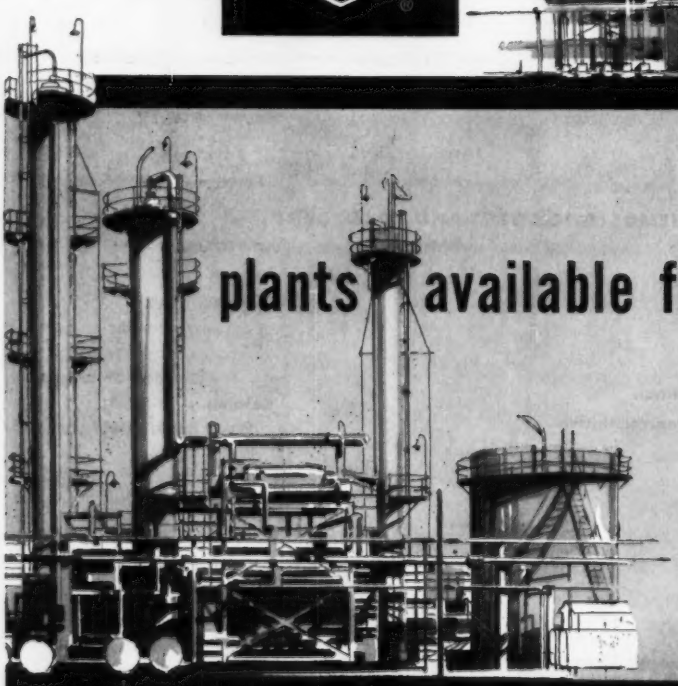

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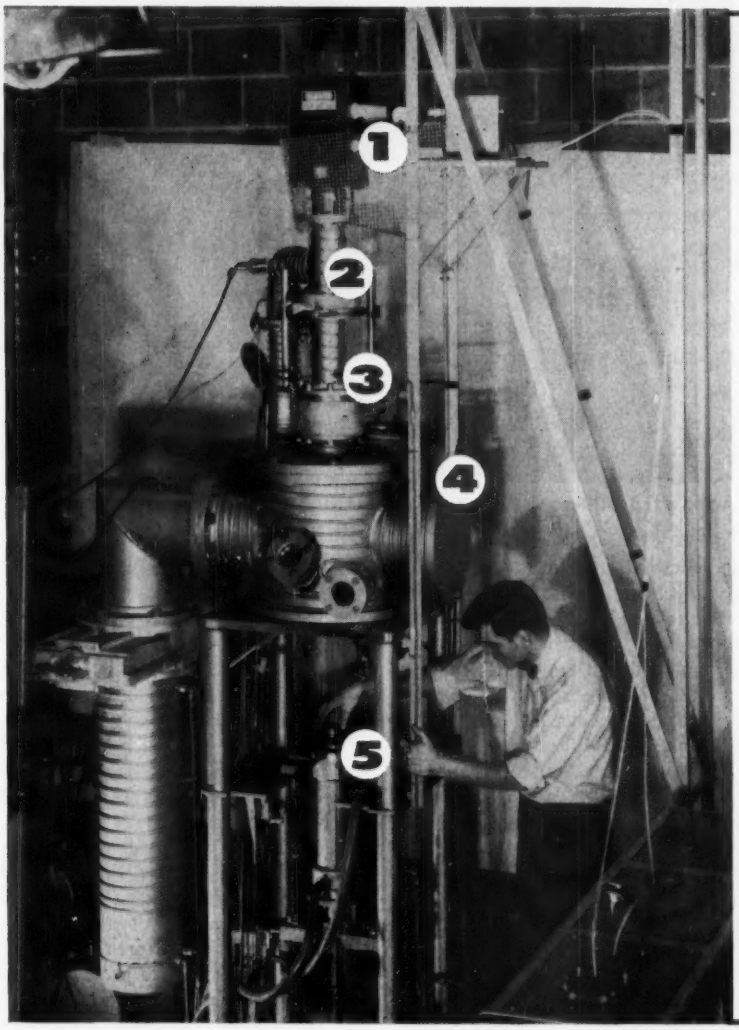


**NRC's Electron-Beam Furnace in Action**

1. ELECTRON GUN, with tantalum source, fires electrons generated by 20,000-volt potential.

2. COIL CONSTRICTS BEAM after initial scattering. Small diffusion pump creates high vacuum.

3. SEAL HAS APERTURE that allows beam to pass, separates vacuum chambers above and below.

4. METAL POWDER IS FED into melting chamber that is evacuated to a moderately high vacuum.

5. COLD MOLD RECEIVES melted metal, is automatically retracted to form 2.8-in.x14-in. ingot.

# New Heat for Electron-Beam Processing

**A three-way battle in electron-beam processing is shaping up this week as a result of new developments by two companies: NRC Equipment Corp. (Newton Highlands, Mass.) is offering a standard-model electron-beam furnace and an electron-beam welding-brazing unit; and Air Reduction Co. has developed an electron-beam welder at its central research laboratories (Murray Hill, N.J.).**

And still another welder is offered this week by Stauffer-Temescal Corp. (Richmond, Calif.), already established in electron-beam furnaces with a commercial unit placed in the field. (*CW Technology Newsletter, Feb. 7*). Other efforts at commercializing electron-beam welders have been made abroad, but the furnace field is led by Stauffer-Temescal and NRC Equipment.

Electron-beam melting—although admittedly expensive—is finding a growing demand in applications where there is a need for ultra-high purity in a very-high melting or highly reactive metal. Among the first candidates: tantalum, columbium, zirconium, molybdenum, tungsten. The electron-beam welder is aimed at a similar type of application, where conventional methods just won't do the job.

NRC's new furnace is designed to produce tantalum ingots 2.8 in. in diameter and up to 14 in. in length. On special order, diameter can be enlarged to 4 in., while the only limitation on length is mechanical practicality. Models for melting other materials can also be designed. The unit now in production sells for about $60,000, is said to offer the following features:

- Two vacuum systems (one for electron emission, the other for melting—*see picture, above*) that protect

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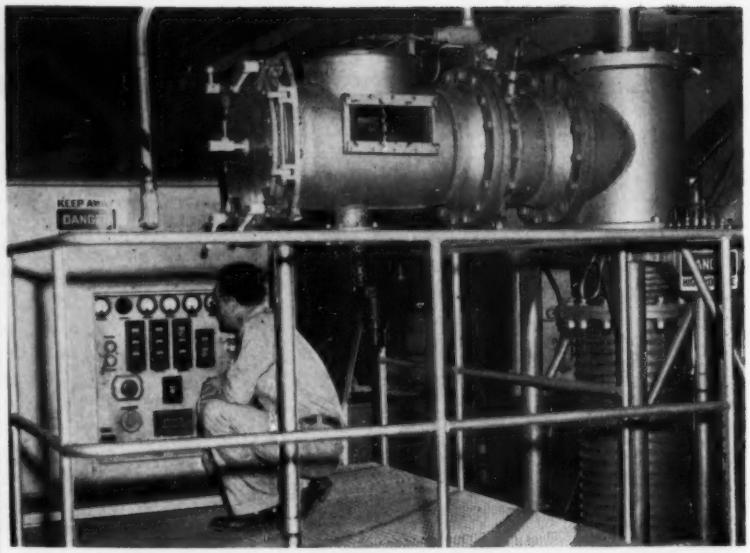

**Airco's 15,000-v. electron-beam welder joins other new entries.**

the electron source from bursts of outgassing from the metal.

- Relatively low cost, due in part to the use of two small vacuum pumps, rather than one large one.
- Ease of operation (the company says the furnace was designed for operation by shop personnel).
- Option of using the machine for vacuum-deposition of thin layers of refractory metals, or for last-minute addition of high-vapor-pressure alloying constituents.
- Powdered or sponge metal is just as useful for feed as a preformed rod.

Stauffer-Temescal has four units that can be duplicated for commercial sale. One—the type sold to Wah Chang Corp. for melting columbium—sells for about $160,000, can make 42-in.-long ingots of tantalum (4-in. diameter), columbium (6-in.) or steel (8-in.). And a $100,000 version can make ingots as small as 1 in. in diameter or as large as 2 in. (tungsten), 3 in. (tantalum), 4 in. (columbium) or 6 in. (steel). The prices of these units can vary about 20% either way, depending on the auxiliary equipment purchased and the specific application. Advantages are said to also include operation by shop personnel and ability to use a metal feed without preforming (e.g., chips, powder).

The question of capacity is a relative one, depending on the amount of purification needed. A feature of electron-beam melting is that it allows a variable rate of throughput; a particularly impure spot can be held in the beam and "cooked" to any desired level of purity, when needed. Stauffer-Temescal, however, pegs its larger unit at an average throughput of 3,000 lbs./month of tantalum.

**Focusing In:** NRC's new furnace—designated the Model 2710 Electron Bombardment Furnace—has been under concerted development during the past few months (*CW Technology Newsletter, Oct. 18, '58*), with the focusing of the electron beam as a principal area of concentration. In addition to providing even heating for the production of a homogeneous ingot, the beam had to be constricted at one point to a diameter that would allow it to pass through an aperture small enough to maintain separation of the two vacuum systems (one at $10^{-3}$ mm. of mercury pressure; the other at $10^{-6}$ mm.).

The two-separate-vacuum-system feature—unique to the NRC unit—is behind most of the machine's extra advantages. Separate vacuums for the electron-beam gun and for the melting operation allows several economic advantages. Of primary importance is the protection of the gun from gaseous bursts of impurities emanating from the metal. And the savings on the pumping systems are swelled by additional savings derived from simplified control circuitry: the beam does not have to be adjusted to compen-

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sate for chamber pressure variations.

Separation of the chambers is possible because the electron beam is emitted by an external gun, as opposed to the Stauffer-Temescal method, which requires a continous voltage between the electron emitter and the feed material. But the beam is the limiting factor in scaling up the NRC unit. Two methods are available for making ingots larger than 4 in. in diameter by the NRC method: (1) a larger beam or (2) multiple beams. The first alternative would require a much larger voltage (than the present 20,000 v.), which in turn would present X-ray hazards; and the second would pose some weighty geometrical design problems. But NRC says that multigun units can be designed for making larger ingots.

Another furnace, with some similarities to the NRC unit, is said to be under development by W. C. Heracus GmbH. (Hanau, Germany).

**Other Techniques:** Arc melting is another approach to high-temperature processing, which offers higher capacities and generally lower costs. It has disadvantages, however, in both the nonconsumable and consumable electrode types.

In the first case, the high voltages tend to break down the electrode, cause spattering of the electrode material into the melt. And high vacuum causes the arc to be unstable. In the case of the consumable electrode, there is the additional problem of forming the electrode; and it doesn't allow control of the melting rate for extra purification, as does electron-beam melting.

Other heating systems, using resistance or induction, present contamination problems, have temperature ceilings of 1700-2100 C (the latter for heat treating, not purification). Electron-beam melting, on the other hand, has no theoretical maximum temperature limit.

**Coating and Alloying:** The two other alternatives for the NRC machine—vacuum evaporation and deposition of refractories and some alloying applications—give it an added versatility that should prove attractive in a variety of applications. For instance, the thin coats of tantalum needed in making capacitors can be applied by the NRC unit, with modification. And use of the electron-beam furnace in conjunction with skull-molding techniques permits alloying of the metal with volatile materials, impossible with arc melting.

**Welding and Brazing:** Allied to the electron-beam furnace in principal, but simpler in design, is the electron-beam welding unit—which can also be used for brazing in certain circumstances. NRC says its new welding model takes just 12 seconds to make a weld that can't be discerned, even by photomicrograph. It removes impurities present, while none are introduced. Air Reduction's model (*picture, p. 40*) is said to have similar advantages, will be custom designed to specific applications (for metals such as beryllium, hafnium and those previously mentioned). Stauffer-Temescal is also joining the parade with a welder aimed at commercial production. Rough price figures for the NRC and Stauffer-Temescal units are $15,000 and $26,000, respectively, while Airco says price could vary widely, depending on the application.

Welding is actually the older application for electron-beam processing, with earlier work being done by the French Atomic Energy Commission and Carl Zeiss (Oberkochem, Germany). Sciaky Bros., Inc. (Chicago) is reported to have a license on the French unit, while Zeiss has leased a welder to Westinghouse.

**Future Prospects:** Despite its higher cost, electron-beam processing is a good bet for growth as demand continues to grow for ever-purer forms of ever-more-hard-to-handle materials.

## PROCESSES

**Hydrogen Peroxide:** Degussa (Frankfort, Germany) uses phenylethanol and tolylethanol as solvents in making 20% hydrogen peroxide, according to preliminary patent DAS 1,039,500.

•

**Plastic Coating License:** A patented fluidized-bed process for coating metals with plastics is now available to all purchasers of Polymer Corp.'s (Reading, Pa.) Corvel fusion bond finishes. The process was previously available only to selected licensees. The process involves moving a heated object through a fluidized bed of dry resin powders, which coats the object uniformly to a thickness of 5 mils up to 62 mils. Powders available include cellulosic, vinyl, epoxy, nylon, polyethylene, chlorinated polyether resins.

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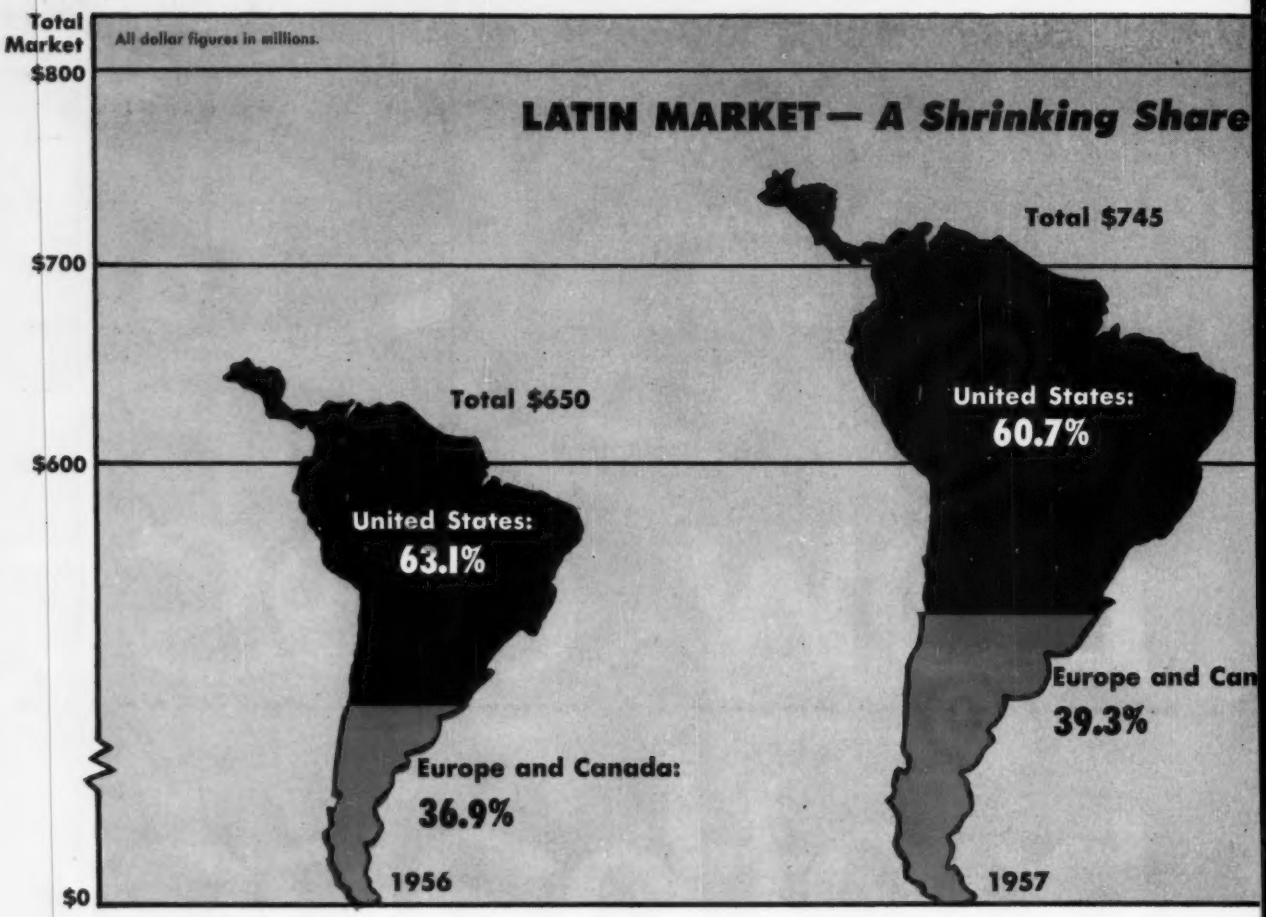


# In Latin America—U.S. Producers'

**Is the U. S. losing its grip on its largest chemical export market—Central and South America? Projections of first-half '58 data from new United Nations statistics and on-the-spot CW reports this week portend such a loss.**

The U.S. share of the lush, $736-million market* slipped to 58.7% last year. In '56, the U.S. gathered 63.1% of a $650-million market.

Underscoring the decline is the U.S. record in eight major chemical groups. The U.S. share of the total market (Jan.-June '58 vs. Jan.-June '57) dropped in six groups; 12.1 percentiles for organic chemicals, 11.1 for fertilizers, 7.5 for soap and cosmetics. Only in the small coal-tar dye market ($10.5-million half-year total), dominated largely by Switzerland (32.7%), and in inorganic chemicals did the U.S. gain. In the latter, the U.S. boosted its share 4.6 percentiles to a total of 61.8% of some $24.4 million (*see table, p. 46*).

**Better Terms:** What's behind the disconcerting news from south of the border? In essence, report Latin buyers, the U.S. is increasingly being outsold by European producers on credit terms and price. Local production looms as a steadily more important factor. And falling prices for key Latin American exports (coffee, sugar, metals) are taking their toll in the form of currency exchange restrictions and import regulations.

Helping offset these factors is U.S. ability to deliver faster — U.S. firms have more-frequent ship sailings, offer faster delivery. More important, however, is U.S. chemical product quality, often better than European counterparts. But that gap, too, is closing.

That's why credit looks like one way for U.S. firms to recapture markets. European producers often offer 180-day terms on chemical raw materials. Euromart is planning a special export credit-insurance system. And there's indication that terms may be more liberal this year.

Despite the steady erosion of their market share, U.S. exporters keep pressing for shorter terms. Many push for payment within 90-120 days. And most sell on the relatively more-severe letters of credit, or sight or

*CW's data is based on the UN's Commodity Trade Statistics. All tabulations presented here differ from previous CW compilations by exclusion of European territories in the Caribbean area. As in the past, Swiss figures are included for drugs and dyestuffs and exports of Soviet satellite nations—except Yugoslavia—are excluded.

# Loss Is Europe's Gain

time drafts. Only in Mexico, and to some extent Cuba, are the more liberal open-account terms prevalent. And significantly, Mexico is the top U.S. customer in Latin America.

Cheaper European prices are another major factor in the situation. In Colombia, for example, European companies, and especially British firms, are underselling U.S. exporters. Despite greater distances, their transportation costs are often less. This led to a decline in U.S. imports that may last throughout '59.

In Venezuela, European chemicals undersell U.S. products as much as 50%, except antibiotics, an area in which U.S. prices are highly competitive.

Other competitive factors are also important. Latin importers score U.S. suppliers for "too much rigidness" in their dealings, compared with, for instance, German willingness to make special arrangements. Often, European suppliers offer Spanish-language literature, while many U.S. houses don't.

And some key importers note that U.S. firms are sending fewer representatives, are making fewer sales calls. Because of this general reluctance to compete, some Venezuelan distributors are giving up established U.S. product lines, are cool to new U.S. offerings.

**Exchange Problems:** Falling U.S. prices and slackening U.S. demand for Latin raw materials are straining dollar balances. Mexico has been hit by slipping coffee and cotton markets, curbs on lead and zinc. Colombia and Brazil also are affected by the coffee situations. Uruguay, a major wool producer, is chafing under the inroads that new synthetics are making in U.S. textiles markets. Venezuela may be affected by oil import curbs, although its gold and dollar reserves are high.

In the first six months of '58, Venezuela's chemical imports from the U.S. fell off $2.3 million from the $27.4-million mark in the same '57 period. The trend will probably get worse in '59, despite generally rising Venezuelan needs.

Argentina's annual trade deficit with the U.S. has averaged $127 million over the past three years. Here, however, the situation is improving. Bolstered by a new federal austerity program and a $330-million aid package from the International Monetary Fund, the U.S. Export-Import Bank and private banks, Argentina has loosened import restrictions. But with the exception of synthetic rubber, carbon black and a few other items, the Argentine government has started import surcharges ranging from 20 to 300% of the product value.

Trade balance problems have led to import restrictions, especially in Brazil and Colombia. Cuba may impose import curbs if imports start rising drastically. And all Latin countries are struggling with soaring inflation and political problems.

**Make It Yourself:** Confronted with trade balance problems, Latin nations are turning toward increased domestic production. But even though U.S. firms are upping their Latin American investments, European firms aren't standing pat. Consider Argentina, for example.

In '58, U.S. companies finished some $16 million worth of subsidiary plants there. Over the '59-'60 period, seven U.S. firms will invest nearly $100 million in new plants—$18 million each for drugs and plastics, some $60 million for synthetic rubber.

Unconditional release of German chemical trademarks and patents, confiscated during the war, will soon explode into a fight for market supremacy between I. G. Farben successors and U.S. firms. Preparing a comeback: Bayer, Badische-Anilin, Hoechst.

Olin Mathieson may soon feel in-

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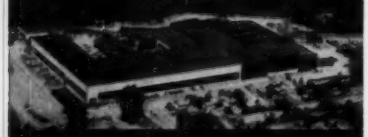

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(Guyed & self-supporting)
Large O.D. Pipe
Jacketed Tanks
Dryer Shells
Mixing Tanks
Stills & Digesters
Retorts
Special Weldments
Steel & Alloy
Plate Construction

WRITE for New Brochure FB-10

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FABRICATING DIVISION
FITZGIBBONS BOILER CO., INC.
Oswego, New York



## Chemical Exports to Latin America

(million dollars)

| | Sales | | Market Share | |
|---|---|---|---|---|
| | 1958 | 1957 | 1958 | 1957 |
| | 1st 6 months | | 1st 6 months | |
| *Pharmaceuticals* | | | | |
| **U. S.** | **$55.6** | **$55.6** | **65.7%** | **68.3%** |
| Switzerland | 11.6 | 11.1 | 13.7 | 13.7 |
| West Germany | 7.7 | 6.3 | 9.1 | 7.8 |
| All exports* | 84.7 | 81.3 | | |
| *Chemical Materials* (not elsewhere specified) | | | | |
| **U. S.** | **40.8** | **40.0** | **54.9** | **56.7** |
| West Germany | 11.6 | 10.1 | 15.6 | 14.3 |
| Canada | 6.7 | 7.6 | 9.0 | 10.8 |
| United Kingdom | 6.7 | 6.7 | 9.0 | 9.5 |
| Netherlands | 2.7 | 1.7 | 3.7 | 2.4 |
| All exports* | 74.3 | 70.5 | | |
| *Organic Chemicals* | | | | |
| **U. S.** | **19.5** | **26.6** | **47.8** | **59.9** |
| West Germany | 9.6 | 9.8 | 23.6 | 22.0 |
| Netherlands | 2.9 | 1.4 | 7.2 | 3.2 |
| United Kingdom | 2.7 | 2.0 | 6.7 | 4.4 |
| All exports* | 40.8 | 44.4 | | |
| *Inorganic Chemicals* | | | | |
| **U. S.** | **24.4** | **22.9** | **61.8** | **57.2** |
| United Kingdom | 5.6 | 7.0 | 14.3 | 17.5 |
| West Germany | 4.6 | 4.4 | 11.7 | 11.0 |
| All exports* | 39.4 | 40.0 | | |
| *Fertilizers* | | | | |
| **U. S.** | **22.2** | **25.4** | **58.5** | **69.6** |
| West Germany | 8.2 | 6.5 | 21.7 | 17.7 |
| Belgium-Luxemburg | 5.2 | 2.7 | 13.7 | 7.3 |
| All exports* | 37.9 | 36.5 | | |

**Includes countries not listed separately.*

creased competition in fertilizer markets. Hoechst and Badische will stress dyes and paint colorants. But initially, the European resurgence will stress drugs. Compania Quimica, backed by Bayer and already making 600 tons/year of phenol, will soon start salicylic acid production for aspirin.

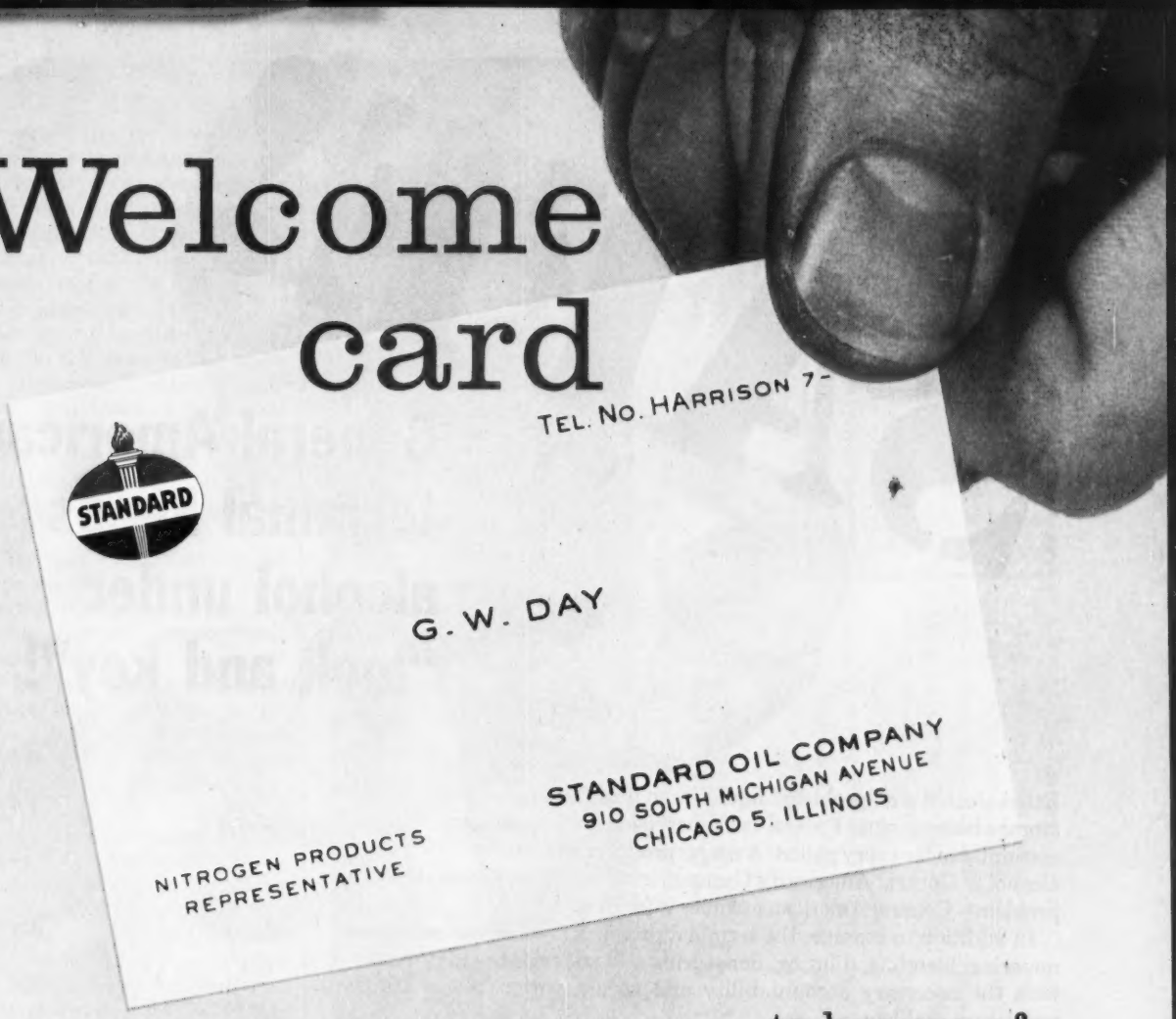
In Colombia, the story is similar. A new soda ash and caustic soda plant has cut deeply into U.S. imports. And a huge fertilizer plant will soon start operation. Local production of chlorine, sodium hydroxide and calcium hypochlorite will soon start in Venezuela.

Prospects for exports to Mexico are also clouded by uncertainty of future domestic output. Mexico's new administration will likely prevent Pemex, the national oil monopoly, from discouraging private investment in petrochemicals.

Plans for scores of petrochemical projects stand ready for U.S. and European financing. Mexican sources point to Olin Mathieson, Celanese, Du Pont, Monsanto and Dow as interested. French financing is behind a big, new fertilizer complex.

Apart from that, other U.S. firms are eyeing soda ash, fluorocarbon gases, tetraethyl lead, phthalic anhydride and formaldehyde. Whether the

# Welcome card




## to buyers of

## Anhydrous Ammonia and Nitrogen Solutions

**A welcome card? Yes, indeed. Here's why:**

**1.** This card is presented by a man from a company that backs up its salesmen's promises for delivery and for products that meet a customer's specifications.

**2.** The customer doing business with Standard Oil knows he is buying from a company with an established reputation . . . a company he knows will give him fair treatment, service and product quality.

**3.** Standard's modern Ammonia and Nitrogen Solutions plant is located in the heart of the country's largest rail- and truck-shipping area. To a customer this means fast, sure deliveries . . . deliveries that can be easily controlled because routes are direct and distances short.

A modern plant capable of producing Ammonia and Nitrogen Solutions on specification. A supplier who knows a customer's requirements *and delivers*. These add up to service a Midwest buyer of Ammonia and Nitrogen Solutions can depend upon. Would you like a Standard Oil man to call on you? Write, wire or telephone Nitrogen Products Department, **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 5, Illinois.**

You expect more from STANDARD and get it!

# SAFE!

## General American terminal keeps alcohol under "lock and key"!

Ethyl alcohol is a "problem" liquid when it comes to storage because close Federal tax supervision holds producers accountable for every gallon. A major producer who stores alcohol in General American's Carteret terminal doesn't have this problem—General American assumes it for him.

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If you have a storage problem involving hard-to-handle liquids, call on General American. Leased terminal facilities give you the privacy, safety, flexibility and service of your own terminal—*without capital investment on your part.* Phone or write today. You'll find . . . *it pays to plan with General American.*

Six terminals at five key-market locations with over 14,000,000 barrels capacity: PORT OF NEW YORK (Carteret, N. J.), PORT OF NEW ORLEANS (Good Hope, La.), CHICAGO, ILLINOIS (Bedford Park), PORT OF HOUSTON (Galena Park and Pasadena, Texas), CORPUS CHRISTI, TEXAS.

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big investment splurge will cut imports or boost them by creating demand for new items remains to be seen. Initially, at least, imports of fertilizers and inorganic and organic chemicals may fall.

**Outlook:** Despite the upsurge of European competition and threats of Iron Curtain country barter deals, the outlook for U.S. firms in two major areas—plastics and drugs—is good. That's mainly because of the big lead that U.S. firms have in those areas and large U.S. investments in Latin countries. And, although its hold is slipping, the U.S. still dominates the scene.

But in many product groups, the future is less cheery. U.S. firms stand to lose their share of South American markets in fertilizers, dyestuffs, heavy chemicals.

The European "Common Market" may have mixed blessings. To the extent that U.S. companies' European subsidiaries will be able to sell south of the border, U.S. corporations may gain. Otherwise, they face losses to expanding European competition.

How can U.S. producers stem the rising strength of foreign competition in South America? Importers give one unanimous answer: the U.S. must become more competitive on price, credit, service, must also push local production. But with the exception of increased investment, U.S. firms so far are showing little inclination to become more competitive.

## Making the Cash Flow

**Rarely does a convention speech stir an audience to immediate action. But at the recent Philadelphia meeting of the National Chemical Credit Assn., Stewart Hebden, assistant treasurer for Rohm & Haas, managed to turn the trick.**

His subject: cash flow. Detailing the methods and advantages of forecasting and improving corporate cash flow, he sparked a motion to establish a committee that would encourage certified public accountant organizations to educate small business management on the merits of cash flow planning.

Cash flow planning, Hebden told the meeting, can avoid fiscal crisis and high cash costs. He contends that accounts receivable represent a "much more permanent investment than does plant equipment" — because capital


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Sorry . . . but we can't presently give you much *use* information on O-Anisaldehyde. From what we've determined, however, this material (you may also know it as O-Methoxy Benzaldehyde) is expected to find uses as a pharmaceutical intermediate and in organic synthesis. We can supply you with our latest technical bulletins and samples. And we'd like to help you investigate any possibilities that the physical properties might suggest to you. Write us.

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| Property Data* | |
|---|---|
| Molecular weight | 136.14 |
| Boiling point (at 760 mm. Hg.) | 238°C. |
| Melting points** | (1) 38-39°C. |
| | (2) 3°C. |
| Specific gravity (liquid) 25°/25° | 1.1274 |
| Specific gravity (solid) 25°/25° | 1.258 |
| Refractive index n 20°D | 1.5608 |
| Odor—burned, slightly phenolic | |
| Solubility in $H_2O$—slightly soluble | |
| Minimum purity | 95% |
| Appearance | white to light tan solid |

*Determinations made on 99% pure material.
**Exists in two crystalline forms

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## SALES

investment is charged off as depreciation, while accounts receivable isn't liquidated to cash until the product line is discontinued. And, for many chemical firms, he adds, accounts receivable can represent 15-25% of total net worth.

To show what improved cash flow can do, Hebden cites an example of a firm with $1.8 billion annual sales and an average collection period of 28.5 days. Increasing that time to 30 days would necessitate a boost of $7.5 million in cash investment and a profit loss of $1.2 million.

Accurate cash flow forecasting can also be a big cost-saving asset. Faced with heavy construction financing needs some time ago, Rohm & Haas set up a program to delay borrowing as long as possible. A special IBM study, based largely on collection variance by product line, showed that the week of shipment had much to do with collections. More important, it enabled Rohm & Haas to reduce its bank accounts by $1-2 million, realize some $30,000-60,000 in earnings from short-term investments.

**Forward Look:** Credit department contributions to corporate profit, Hebden contends, will be largely tied to advance thinking. Now is the time, he said, to ask:

- Are present terms of sale adequate for future development? They have a big bearing on corporate cash position.
- Are present policies adequate to handle a 100% increase in accounts receivable? Current CPI growth rates point to that eventuality within 5-10 years.
- What are you doing to encourage cash planning among your smaller customers? Many are new businessmen in new industries and are pushing expansion; and many operate without a cash plan, have serious collection problems. Upshot: pressure for longer terms from their suppliers.

It was this last point that sparked the motion to study the possibility of having CPA's encourage cash forecasting by small firms. The study may also cover other joint CPA-National Chemical Credit Assn. educational efforts.

Results of the study won't be known for about a year. But, at the very least, the study is evidence that chemical credit men are leaving no avenue unexplored in their quest to boost corporate profits.


# how to give yourself the air

Some raw materials are dirt-cheap—or even air-cheap. It's a steal when you can pump in a raft of outside air and ship nitric oxide or nitric acid out the back door. Maybe you want something less lethal from your oxidation-reduction process but whatever it is, activated charcoal when used as a catalyst does the job over and over again—and at low cost, too.

# how to find a silver lining

It's clouds of money back in the till when solvent vapors go back in the process. Solvent vapors can play hob with the process—and the people. One activated charcoal solvent recovery system took the contaminant out of the air, the complaint out of the employee, and put 2000 gallons of solvent back into the process daily. Are you prepared for recovery?

# activated charcoal

Activated charcoal (or carbon), a hard, granular, black material, acts as a molecular sponge, purifies air, gases, liquids—recovers solvents—removes odors and impurities—does hundreds of jobs. Write for Bulletin E-188. Barnebey-Cheney, Columbus 19, Ohio.

Barnebey Cheney

MAKE Pittsburgh Coke & Chemical your "one source" supply of phthalic, maleic and fumaric . . . and realize immediate savings in *time* and *money*. A single purchase order simplifies your paper work. Mixed carload shipments reduce transportation costs and permit tighter inventory control.

Buy "all three" from Pittsburgh Coke and you deal with *one* efficient, coordinated sales and service team, familiar with your operations and requirements.

But, most important of all, enjoy the confidence of doing business with a *basic* producer of uniform, high-purity materials, backed by alert, responsive sales and technical service. If your 1959 production calls for phthalic anhydride, maleic anhydride or fumaric acid, write to Pittsburgh Coke *today* for samples and specification sheets.

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Superiority of GROCO 2 RED OIL revealed in unretouched photograph of low temperature test. Samples of GROCO 2 (left) and competitive red oil (right) were refrigerated at 36°F. for 24 hours side by side. No solids separated out of GROCO 2 RED OIL—it remained so transparent that technician's fingers and steel tray are clearly visible through vial. On right, solid acids separated in large amount.

# TITRE IS LOWEST IN GROCO 2 RED OIL

The unretouched photo above shows the results of a recent low temperature test between GROCO 2 and a competitive red oil. The GROCO 2 RED OIL (left) remained crystal clear to the bottom of the vial. The other material became heavily opaqued with frozen saturated acids.

GROCO 2 RED OIL's exceptionally low content of saturated fatty acids—titre 3°C.—is advantage enough in itself to make it top choice for many processors. More than one producer of a liquid shampoo, for example, prefers GROCO 2 RED OIL because it gives a formulation that stays liquid at low temperatures.

Equally outstanding is the oxidation stability of GROCO 2 RED OIL. In the Mackey Test, GROCO 2 remained under 105°C. for 5 hours. There are no oxidation discoloration problems when you formulate with GROCO 2 RED OIL. And there is an absolute minimum of unusable components, making GROCO 2 the best money value of any red oil in its class. Quality is high uniformly from shipment to shipment.

You consistently enjoy an edge in storage, handling, processing, and consumer acceptance when you "Always specify A. Gross"... whether your end products are soap, cosmetics, plastics, paints, polishes or emulsifiers.

• ***Send for samples and brochure, "Fatty Acids in Modern Industry."***

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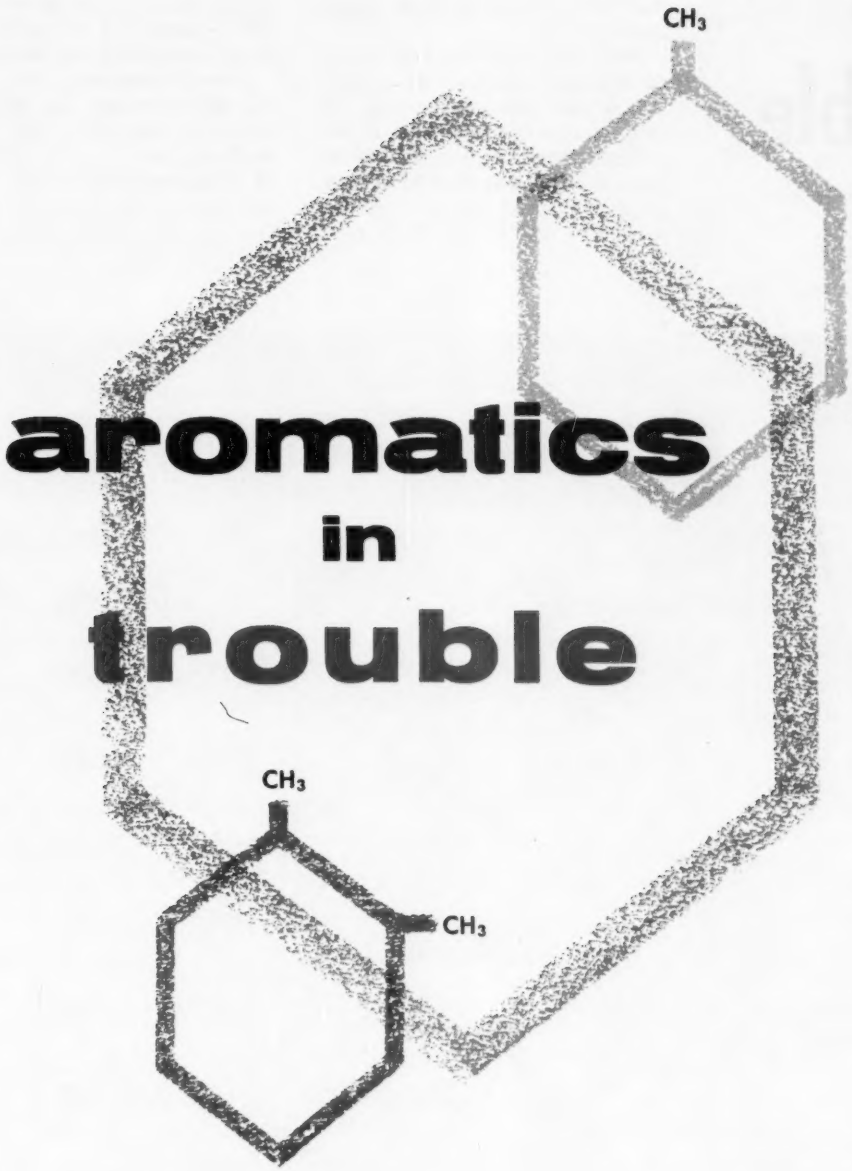
## *Chemical Week Report*

*by Neil Hansen*
*and Deane Groves*




# aromatics in trouble

**The facts, figures and trends behind the CPI's biggest overcapacity headache.**

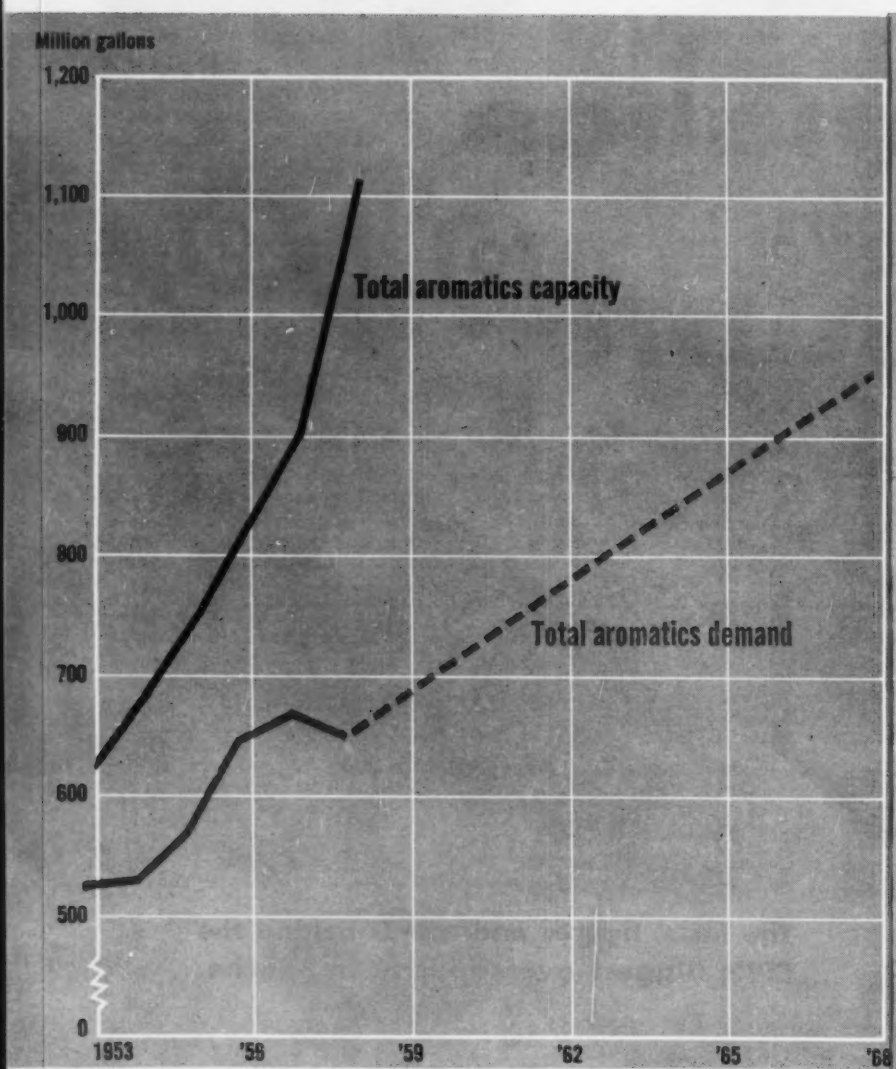
# aromatics in trouble

**By midyear,** CPI aromatics capacity will hit a record high—1,117 million gal./year. But mighty little reward attaches to this particular record. Reason: BTX demand currently lags capacity by a whopping 461 million gal./year and probably will still trail far behind it in '68—unless producers find new BTX markets or expand existing ones.

While it's tough for most of the 60 ubiquitous suppliers of benzene, toluene and xylene to face these cold facts objectively, they must if aromatics profits and prices are to improve over the long haul. Meanwhile, there's no better way to begin the uphill fight than having all the facts, figures and market intelligence available. To help provide them, CHEMICAL WEEK offers this comprehensive BTX report.

It contains the latest available information on company production capacities, tells what's new and what's happening in BTX supply, demand and pricing. Key end-use patterns of current demand and '68 projected demand are included and analyzed.

Some 21 petroleum refiners, 24 iron and steel producers, 12 operators of merchant coke ovens and light-oil distilleries, as well as 3 manufacturers of by-product benzene from styrene, are directly concerned with the outcome of this serious supply-demand-



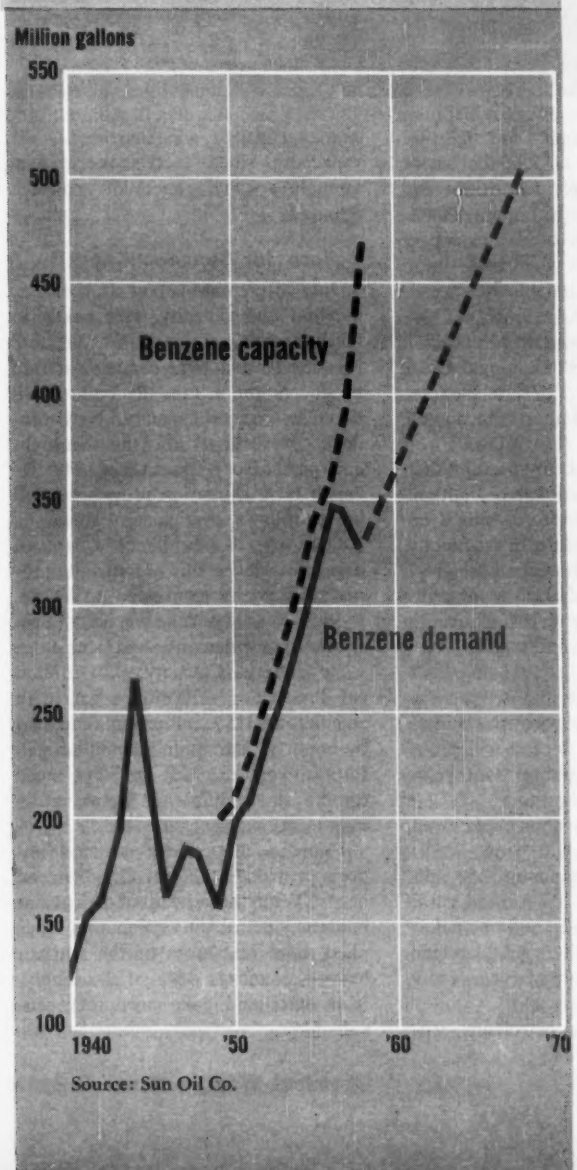

| | Total Capacity | Aromatics Demand |
|---|---|---|
| 1953 | 637 | 531.5 |
| 1954 | 689 | 538.1 |
| 1955 | 750 | 572.9 |
| 1956 | 831 | 651.3 |
| 1957 | 905 | 670.0 |
| 1958 | 1,117 | 656.0 |
| 1968 (proj.) | — | 958.0 |

| | Benzene Capacity | Benzene Demand |
|---|---|---|
| | (million gallons) | |
| 1940* | — | 133 |
| 1941 | — | 155 |
| 1942 | — | 165 |
| 1943 | — | 199 |
| 1944 | — | 268 |
| 1945 | — | 218 |
| 1946 | — | 165 |
| 1947 | — | 187 |
| 1948 | — | 185 |
| 1949 | 200 | 158 |
| 1950 | 210 | 204 |
| 1951 | 235 | 225 |
| 1952 | 252 | 244 |
| 1953 | 282 | 261 |
| 1954 | 314 | 289 |
| 1955 | 340 | 315 |
| 1956 | 360 | 350 |
| 1957 | 395 | 347 |
| 1958 | 470 | 330 |
| 1968 (proj.) | — | 510 |

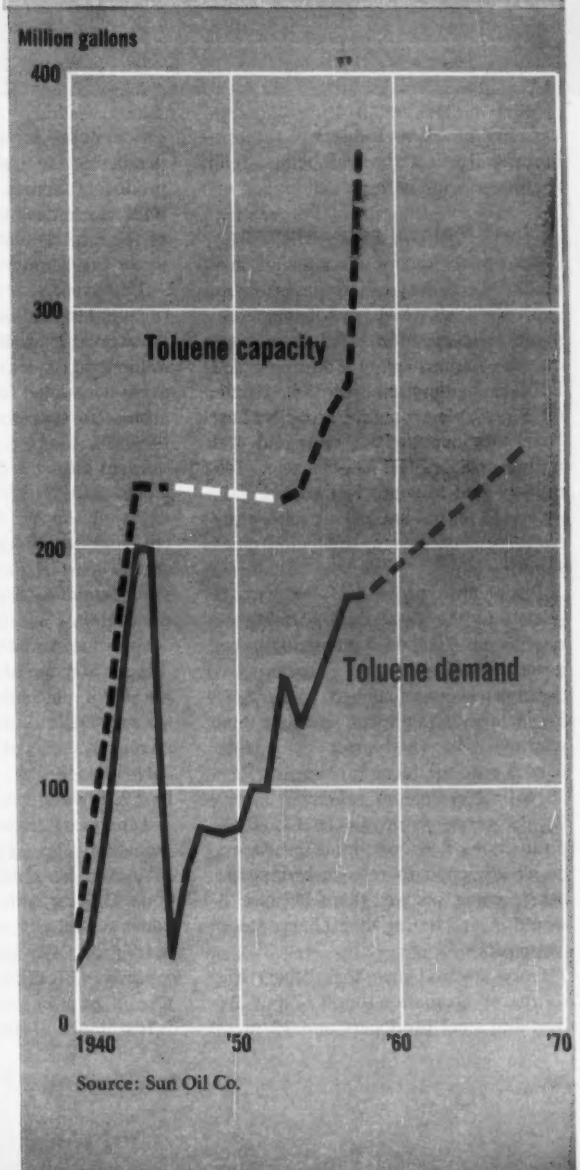
*Coal-tar distilleries or imports provided all benzene in 1940-48.

| | Toluene Capacity | Toluene Demand |
|---|---|---|
| | (million gallons) | |
| 1940 | 40 | 30 |
| 1941 | 85 | 38 |
| 1942 | 130 | 94 |
| 1943 | 180 | 163 |
| 1944 | 225 | 204 |
| 1945 | 225 | 200 |
| 1946 | 225 | 34 |
| 1947** | — | 60 |
| 1948 | — | 84 |
| 1949 | — | 82 |
| 1950 | — | 84 |
| 1951 | — | 102 |
| 1952 | — | 105 |
| 1953 | 220 | 157 |
| 1954 | 225 | 139 |
| 1955 | 240 | 150 |
| 1956 | 255 | 165 |
| 1957 | 270 | 180 |
| 1958 | 362 | 181 |
| 1968 (proj.) | — | 243 |

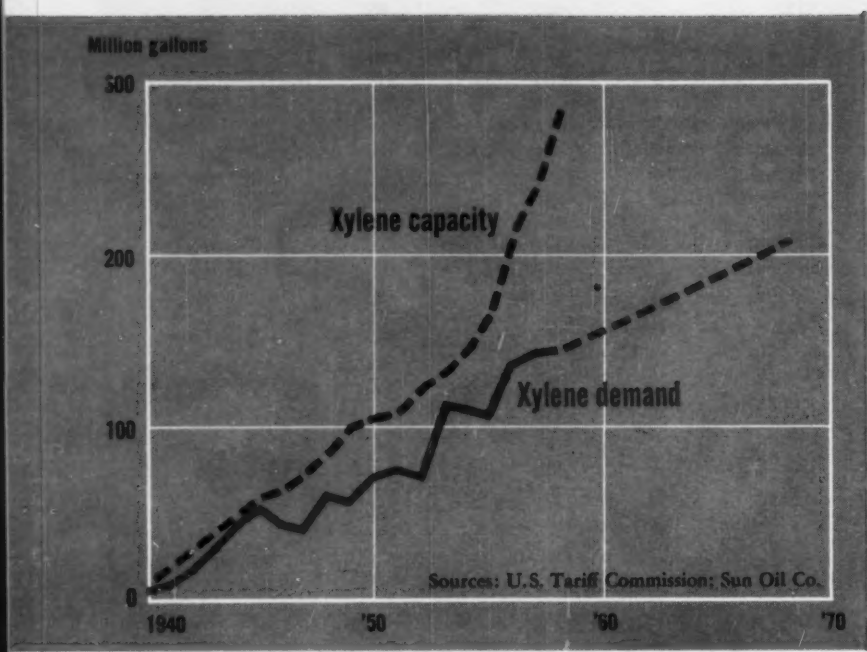
**After World War II, some toluene plants were converted to benzene production or put on stand-by. Toluene capacity in 1947-52 is uncertain.




Source: Sun Oil Co.




Source: Sun Oil Co.




| | Xylene Capacity | Xylene Demand |
|---|---|---|
| 1940 | 10 | 5.6 |
| 1941 | 20 | 8.6 |
| 1942 | 30 | 19.3 |
| 1943 | 40 | 30.5 |
| 1944 | 50 | 47.8 |
| 1945 | 60 | 55.9 |
| 1946 | 65 | 44.9 |
| 1947 | 75 | 41.4 |
| 1948 | 87 | 61.1 |
| 1949 | 100 | 57.6 |
| 1950 | 105 | 71.9 |
| 1951 | 110 | 75.7 |
| 1952 | 125 | 71.8 |
| 1953 | 135 | 113.5 |
| 1954 | 150 | 110.1 |
| 1955 | 170 | 107.9 |
| 1956 | 216 | 136.3 |
| 1957 | 240 | 143.0 |
| 1958 | 285 | 145.0 |
| 1968 (proj.) | — | 205.0 |

capacity problem. Indirectly, the outcome will affect the well-being of all the process industries.

### Two Main Supply Sources

Last year, record amounts of aromatics were derived from petroleum sources. Today, 21 petroleum companies (*see pp. 60 and 65,* list of producers' names, plant locations and BTX capacities) control 77% of the total available aromatics capacity. Last year, they supplied an estimated 489 million gal. of BTX—benzene, 145 million gal.; toluene, 170 million gal.; xylene, 174 million gal., representing 69% of last year's total aromatics supply.

Petroleum aromatics output is geared to the catalytic reforming of naphthenes gleaned from straight-run gasoline and naphtha. Reforming is the most economical way to upgrade low-octane, straight-run gasoline and naphthas to high-aromatic, high-octane gasoline blend stocks.

Not all petroleum reformer capacity, however, is available for BTX production. Reasons: some producers aren't equipped to recover aromatics; others won't recover them because it would mean altering their charge stock composition.

Coke ovens are the other big source of aromatics supply. Now, 24 iron and steel producers and 12 merchant coke producers and light-oil distilleries (*see pp. 60 and 65,* list of producers' names, plant locations and BTX capacities) control about 23.4% of the total available aromatics capacity in the country.

Last year, they supplied an estimated 165 million gal. of BTX—benzene, 125 million gal.; toluene, 32 million gal.; xylene, 8 million gal. Coke ovens accounted for 23.2% of the total aromatics supply. Imports accounted for 7.8%.

Light oil is the coke by-product that yields BTX on fractional distillation. Light-oil supply, therefore, hinges on coke output, which in turn is directly geared to steel production. Last year, steel output declined and, as a result, the ratio of petroleum aromatics to coke-oven aromatics increased.

Today, new coke ovens being built are for replacement and to provide for the steel industry's growth requirements. By '68, coke output will probably have hit 90 million tons/year. In '57, it was 73 million tons.

Ten years from now, coke-oven aromatics capacity will grow 23%: coke-oven benzene capacity, 250 million gal./year (now 207 million gal.); toluene capacity, 52 million gal./year (now 42 million gal.); xylene capacity, 20 million gal./year (now 12 million gal.).

It's doubtful that petroleum aromatics capacity will increase at all, especially since there's more than enough capacity to meet '68 projected demand.

### Race for Benzene Capacity

Just after World War II, benzene demand and capacity were neatly in balance (*see graph on p. 55*) until pressing Korean War demands started producers on a race to build additional aromatics capacity. New producers were lured into the then-tight and profitable BTX market. The feverish BTX expansion program ended up as today's overcapacity dilemma.

Soon after Korea, benzene demand began to slacken off. Meanwhile, aromatics capacity continued to climb. By last year, benzene capacity, production and demand had shaped a sorry pattern. Capacity: 470 million gal. Production: 270 million gal. (with an additional 55 million gal. supplied by imports). Demand: 330 million gal. Large inventories still on hand made up the small difference between demand and supply.

Prior to '50, coke ovens and imports provided 100% of U.S. benzene needs. With the advent of petroleum benzene, petroleum companies supplied more and more of the market, today account for 46% of the supply. Iron, steel and coke producers provide 54%.

Even though benzene production volume has been well under capacity for some time, imports continue to pour in at generally lower-than-market prices and skim off some of the market. But even if benzene imports were cut off tomorrow, the formidable overcapacity problem that befuddles the industry undoubtedly would still persist.

Eastern Europe and the U.S.S.R. supply 75% of the U.S. benzene imports. Most imported benzene must be purified first before it reaches the market. Tar distillers get this business, and for that reason their reported production must be written off almost entirely as imports rather than as domestic output.

Eventually, imports will probably decline. Reason: as chemical industries develop in Russia and in eastern Europe, benzene tonnages available for export will drop off. To some extent, this should help alleviate the U.S. benzene overcapacity problem, but only in a small way.

**Benzene Markets Diverse:** Of all the aromatics, benzene finds the most diversified end-uses, claims the largest sales volume of the aromatics—about 50.2% of the market. In '58, some 330 million gal. were marketed, 17 million gal. less than were sold in '57, a decline directly traceable to recession-caused cutbacks.

In the table on p. 58, benzene end-use markets are compared for '57 and '58. The table projects the benzene demand pattern to '68, when usage will likely reach some 510 million gal., a 55% increase over today's volume.

**Big Outlet—Styrene:** Styrene producers, the largest consumers of benzene, worked off an estimated 130 million gal. in '58, a drop of 10 million gal. from '57 demand. Styrene's end-use markets are shown in the table at the top of p. 59.

It's apparent that plastic end-uses for styrene are the fastest-growing of all the styrene markets. Demand for low-cost, general-purpose polystyrene rose from 260 million lbs. in '50 to a peak of 475 million lbs. in '56. In '57, the market tapered off slightly to 453 million lbs., due mainly to inroads made by the newer polyolefins, as well as other resins. But low-cost and flexibility in use are in polystyrene producers' favor, may swell the market to 700 million lbs. by '68.

SB-R (GR-S) synthetic rubber is another major outlet for styrene that's growing in importance. SB-R demand has jumped from 358,000 long tons in '50 to 825,000 l.t. in '57. Synthetics currently account for about 60% of the total U.S. rubber market. But because the supply of natural rubber is a relatively fixed quantity, the market share of synthetics is expected to increase to 75% (equivalent to 1.5 million l.t.) by '68.

If SB-R demand holds up against the competition of other synthetic elastomers, production will climb to about 1.2 million l.t. by '68. Styrene requirements will trail on the heels of this increase, may reach an estimated 675-million-lbs./year demand in 10 years.

Uncertainties cloud the SB-R forecast: development of new, low-cost competitive synthetic rubbers could cut SB-R out of some of the markets. Polybutadiene is one synthetic that's currently garnering a good deal of attention among synthetic rubber producers. At present, there's only speculation about how formidable a competitor polybutadiene may become.

Other important styrene markets include: latices, high-impact resins and polyesters — outlets with excellent growth potential.

By '68, styrene demand will probably have hit 1.6 billion lbs. Some 200 million gal. of benzene would then be needed for styrene manufacture alone.

**Synthetic Phenol Second:** Second to styrene in importance as a large-scale consumer of benzene is synthetic phenol. About 65 million gal. of benzene were consumed in phenol manufacture in '57, but demand dropped by 5 million gal. in '58.

If production of phenol-based epoxies, nylon-6 and polycarbonate resins develop as predicted, and other well-established phenol markets grow at normal pace, total phenol demand will reach 770 million lbs./year by '68. About 45 million lbs./year of coal tar-supplied phenol deducted from this total leaves a projected synthetic phenol demand of 725 million lbs./year. Phenol production will then consume 100 million gal./year of benzene.

Here's how phenol demand shaped up in '57, shown by end-uses: phenolic resins took 325 million lbs.; chemicals, 145 million lbs.; solvent refining, 20 million lbs.; miscellaneous end-uses and export, 30 million lbs. Overall, phenol demand is due for a 48% increase by '68.

But not all phenol markets will figure equally in this growth. Phenolic resins, for example—now the largest phenol consumer (60-65% of demand)—have already passed their peak growth. In '50, phenolics production hit 450 million lbs.; output grew to a peak 565 million lbs./year in 1955-56. By '57, production had tapered off to 530 million lbs., will likely show little increase in the next 10 years. Reasons: phenolics are a "mature" growth commodity. Besides, they face strong competition from the newer polyesters and the improved thermoplastics.

Phenol-for-phenolics demand should increase some, however, maybe 75 million lbs./year by '68. Total phenol demand in this particular end-use will then equal 400 million lbs./year.

But apart from phenolics, phenol is used to manufacture 2,4-D herbicides, salicylic acid, pentachlorophenol wood preservative, picric acid and various dye intermediates as well as the big-growth-potential products, epoxies, nylon-6 and polycarbonates.

Epoxy resin production now tallies 40-50 million lbs./year; outlook for '68 is 200 million lbs. Although epoxies are among the high-cost resins, they're being widely accepted for many uses: adhesives, potting compounds for electronic equipment and high-strength plastics for making sheet-metal dies and forms.

Another up-and-coming phenol outlet is nylon-6, now accounting for 10% of all nylon output (some 300 million lbs. in '58). Nylon-6 plastics and fiber production, based on phenol-derived caprolactam, competes on a price and quality basis with nylon-66 in industrial textile manufacture, as well as in tire cord and molded plastics.

Polycarbonate, another newcomer on the plastics scene, is synthesized from bis-phenol A and phosgene on a semiworks scale by General Electric Co. Eastman Kodak also is active in developing the new polymer, as is Bayer in West Germany. Because

# Primary End-Use Pattern

| BENZENE END-USES | 1957 | 1958 (est.) | 1968 (est.) |
|---|---|---|---|
| | | *(million gallons)* | |
| Styrene | 142.0 | 130.0 | 200.0 |
| Synthetic phenol | 65.0 | 60.0 | 100.0 |
| Dodecyl benzene | 35.0 | 33.0 | 50.0 |
| Synthetic fibers | 30.0 | 30.0 | 30.0 |
| Aniline | 14.0 | 12.0 | 20.0 |
| DDT | 13.0 | 13.0 | 20.0 |
| Di-, monochloro benzenes | 9.0 | 8.5 | 15.0 |
| Maleic anhydride | 7.0 | 8.0 | 20.0 |
| Diphenyls | 4.0 | 4.0 | — |
| Benzene hexachloride | 3.5 | 3.5 | 5.0 |
| Nitrobenzene | 2.5 | 2.0 | — |
| Miscellaneous | 20.0 | 20.0 | 50.0 |
| Export | 3.0 | 5.0 | — |
| Total benzene demand | 348.0 | 329.0 | 510.0 |

*Sources:* American Coke & Coal Chemicals Institute; Sun Oil Co.

| TOLUENE END-USES | 1957 | 1958 (est.) | 1968 (est.) |
|---|---|---|---|
| | | *(million gallons)* | |
| Aviation gasoline | 50 | 50 | 50 |
| Motor gasoline | 45 | 45 | 75 |
| Solvents | 25 | 25 | 30 |
| Chemicals* | 20 | 20 | 30 |
| Explosives | 10 | 10 | 8 |
| Plastics | 5 | 6 | 25 |
| Export | 25 | 25 | 25 |
| Total toluene demand | 180 | 181 | 243 |

*Includes dyes, intermediates, drugs, pharmaceuticals, etc. *Sources:* BDSA; Sun Oil Co.

| XYLENE END-USES | 1957 | 1958 (est.) | 1968 (est.) |
|---|---|---|---|
| | | *(million gallons)* | |
| Solvents | 50 | 50 | 60 |
| Aviation gasoline | 50 | 50 | 50 |
| Dibasic acids | 15 | 17 | 60 |
| Miscellaneous chemicals | 15 | 15 | 20 |
| Export | 15 | 13 | 15 |
| Total xylene demand | 145 | 145 | 205 |

*Sources:* BDSA; Sun Oil Co.

| STYRENE END-USES | 1957 | 1968 (est.) |
|---|---|---|
| | *(million pounds)* | |
| Polystyrene | 450 | 700 |
| SB-R (synthetic rubber) | 460 | 675 |
| Styrene-butadiene latex | 50 | 75 |
| High-impact resins | 45 | 100 |
| Polyesters | 20 | 50 |
| Alkyds | 7 | 10 |
| Other resins | 15 | — |
| Miscellaneous | 25 | — |
| Total styrene demand | 1,072 | 1,610 |

polycarbonates are strong and display high melting points, they may well capture large markets, despite their high cost and chemical complexity.

**Dodecyl Benzene Ranks Third:** Dodecyl benzene producers are the third-largest consumers of benzene. DDB, important in synthetic detergents manufacture, accounted for about 35 million gal. of benzene in '57, but demand tapered off to 33 million gal. in '58, due to the recession bite. By '68, projected demand for benzene in DDB manufacture will be around 50 million gal./year.

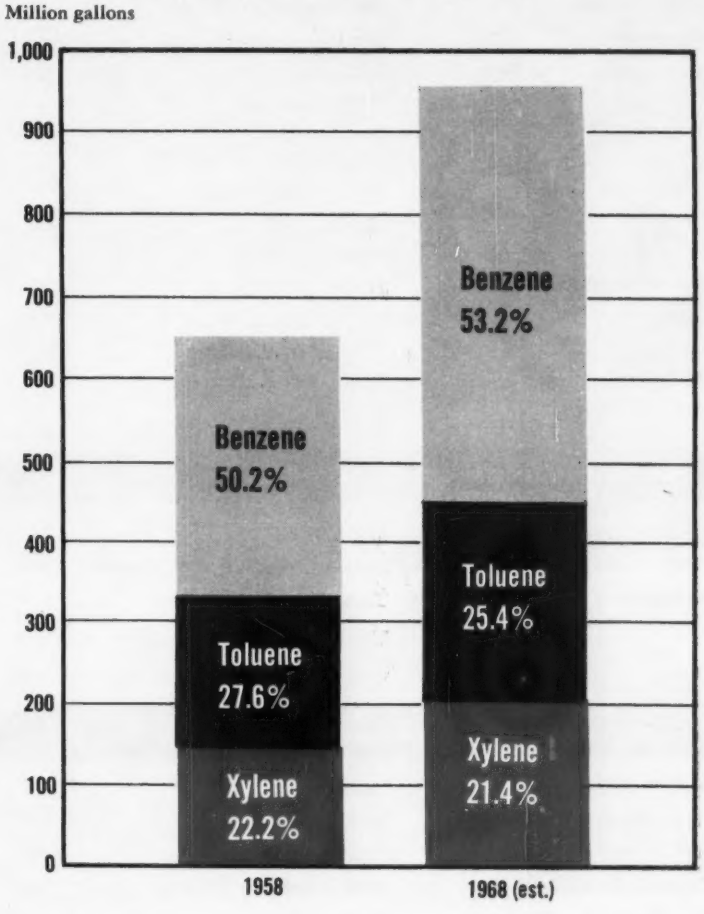
Although the syndets market continues to make inroads into soap markets (in '58, synthetics accounted for 72.8% of soap-syndet sales), the rate of advance is slowing—syndets increased their sales volume 5.3% in '56, 3.1% in '57, 2.1% in '58.

**Fourth-Place Fibers:** Du Pont and Chemstrand are big consumers of benzene for nylon-66 production, but because nylon production figures are a closely guarded secret, only rough estimates are available on benzene tonnages consumed.

In '57, about 300 million lbs. of nylon were produced, requiring 25-30 million gal. of benzene. In the past few years cyclohexane has become the preferred raw material to benzene for adipic acid production because it eliminates a hydrogenation step in the process. On the other hand, cyclohexane recovered directly from a petroleum fraction must be of high purity before it can be used for nylon production.

Because there seems to be growing preference for cyclohexane in nylon manufacture, benzene consumption

Demand Will Grow—
an estimated 46.3% by 1968
—but not enough to ease overcapacity.



# 60 Primary BTX Producers

## Petroleum Aromatics Producers

| | Plant location | Capacity (million gallons/year) | | |
|---|---|---|---|---|
| | | BENZENE | TOLUENE | XYLENE |
| Amoco (stand-by) | Texas City, Tex. | 15 | 10 | 5 |
| Atlas Processing | Shreveport, La. | 8 | — | — |
| Continental Oil | Lake Charles, La. | 4 | — | — |
| | Ponca City, Okla. | 5 | — | — |
| Cosden | Big Spring, Tex. | 3 | 7 | 9 |
| Delhi-Taylor | Corpus Christi, Tex. | 18 | 14 | 12 |
| Eastern States | Houston, Tex. | 4.5 | — | — |
| Esso | Baton Rouge, La. | 13 | 9 | — |
| Frontier Oil* | Buffalo, N. Y. | 5 | 8 | — |
| Great Southern | Corpus Christi, Tex. | 9 | 12 | — |
| Gulf Oil* | Port Arthur, Tex. | 30 | 5 | — |
| Humble Oil* | Baytown, Tex. | 25 | 50 | 75[1] |
| Pure Oil | Toledo, O. | — | 9 | 17 |
| Richfield Oil* | Wilmington, Calif. | 18 | 18 | — |
| Roosevelt Oil | Mt. Pleasant, Mich. | 6 | 3 | — |
| Standard of California | El Segundo, Calif. | 20 | 25 | 25 |
| | Richmond, Calif. | — | — | —[1] |
| Shell Oil | Houston, Tex. | 15 | 30 | — |
| | Wood River, Ill. | — | 13 | 17 |
| | Wilmington, Calif. | 9 | 10 | 10 |
| Sinclair* | Marcus Hook, Pa. | — | 6 | 15[1] |
| | Houston, Tex.[2] | — | 20 | 45[1] |
| Standard of Indiana | Whiting, Ind. | 15 | 25 | 10 |
| Suntide | Corpus Christi, Tex.[3] | 5 | 13 | 11 |
| Sun Oil | Marcus Hook, Pa. | 20 | 25 | 15 |
| Vickers Petroleum | Potwin, Kan. | 2 | 5 | 7 |
| | Total | 249.5 | 317.0 | 273.0 |

## Styrene By-Product Aromatics Producers

| | | | | |
|---|---|---|---|---|
| Velsicol | Marshall, Ill. | 5 | — | — |
| Dow | Freeport, Tex. | 5 | — | — |
| Monsanto | Texas City, Tex. | 3 | — | — |
| | Total | 13 | 3 (est.) | (small) |

*New in '58. [1]Company separates xylenes. [2]Due early in '59. [3]Building o-xylene separation plant.

## Coke-Oven Aromatics Producers

| | | | | |
|---|---|---|---|---|
| Alan Wood Steel | Swedeland, Pa. | 1.6 | 0.3 | 0.1 |
| Armco Steel | Middletown, O.* | 3.7 | 0.7 | 0.25 |
| Bethlehem Steel | Bethlehem, Pa.* | 29.9 | 5.8 | 1.8 |
| Colorado Fuel & Iron | Pueblo, Colo. | 3.0 | 0.7 | 0.2 |
| Crucible Steel | Midland, Pa. | 1.9 | 0.6 | 0.1 |

**Home Office*

**Table continued on p. 65**

# *Puts the finishing touch on '59 cars*

Enjay Methyl Ethyl Ketone is a vital solvent used in the production of acrylic lacquers that are found on many of today's new cars. Water and dirt slide off their remarkable jewel-smooth surfaces—so lustrous and durable they last three times longer than conventional finishes. Enjay Petrochemicals are constantly at work helping to improve existing products and make new products better. Our technical staff is available to help improve your products through the use of petrochemicals. For information and assistance, nine conveniently located offices stand ready to serve you.

**EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY**

ENJAY
PETROCHEMICALS

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# *Announcing* new

## These plastic-coated glass containers

The wide range of colors are eye-catching on store shelves, attractive in the home.

Owens-Illinois plastic-coated glass packages are the ideal containers for a growing number of products.

# Owens-Illinois Pressure Packages

## combine convenience and product protection

These new Owens-Illinois plastic-coated glass packages give your pressure-packed products the protection which only *glass* can provide.

These convenience packages are the result of careful research, engineering, and design by Owens-Illinois who is ready to supply technical help in the packaging of *your* product.

Brilliantly dressed in a wide range of exciting colors and topped with handsome caps, Owens-Illinois plastic-coated glass containers can be decorated with any design to create eye-catching, sales-building packages.

DURAGLAS CONTAINERS
AN (O) PRODUCT

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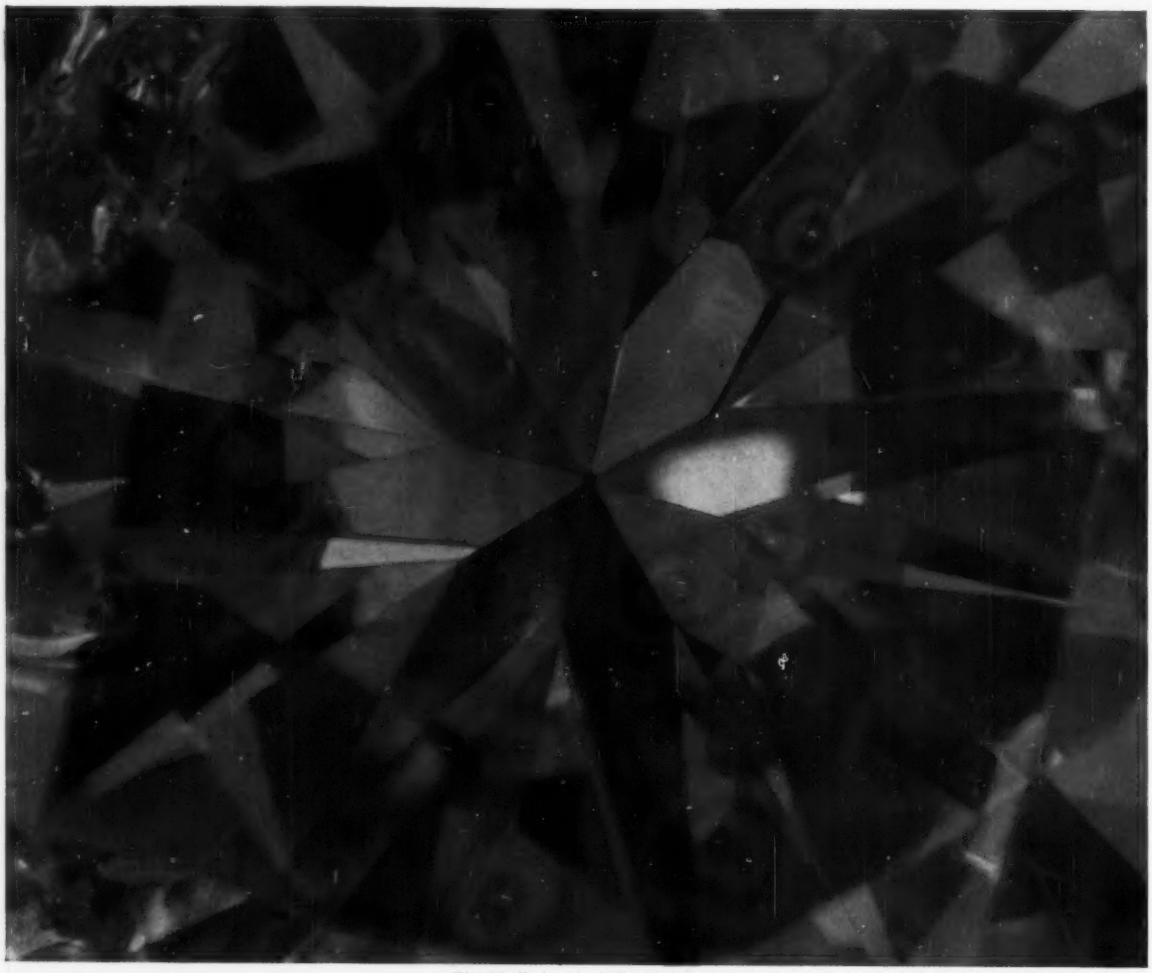


The Shell chemicals listed below are sources of many important commercial products.

# Take a closer look in a different light...

A closer look at familiar things in a different light often helps us recognize many interesting and attractive features. This close-up photograph of a diamond in a red light gives us a dramatic new perspective on this familiar gem.

The Shell chemicals in the column at the right may be familiar to you. But a closer look in a different "light" may lead to new and profitable products for your company.

Each of the listed chemicals is used in manufacturing many other important industrial materials. Their reactivity leads to an extensive and growing chemistry that is well worth your investigation. All listed products are available in commercial quantities.

Your Shell Chemical representative will gladly help you take a closer look at the many practical applications of these or other Shell chemicals. Samples and technical literature are available at your request.

Allyl Alcohol
Allyl Chloride
Bisphenol A
Dimethyl Ketone
Epichlorohydrin
Ethyl Amyl Ketone
Hexylene Glycol
Hydrogen Peroxide
(including 90 per cent)
Methyl Isobutyl
Carbinol

**SHELL CHEMICAL CORPORATION**
**INDUSTRIAL CHEMICALS DIVISION**

Atlanta • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver

SHELL

## Coke-Oven Aromatics *(continued)*

| | Plant location | Capacity | | |
|---|---|---|---|---|
| | | BENZENE | TOLUENE | XYLENE |
| Detroit Steel | Portsmouth, O. | 1.5 | 0.4 | 0.09 |
| Donner-Hanna | Buffalo, N. Y. | 3.5 | 0.65 | 0.15 |
| Granite City Steel | Granite City, Ill. | 1.2 | 0.25 | 0.05 |
| Inland Steel | Chicago, Ill.* | 8.5 | 1.30 | 0.34 |
| Interlake Iron Corp. | Cleveland, O.* | 3.2 | 0.55 | 0.11 |
| International Harvester | S. Chicago, Ill. | 1.8 | 0.50 | 0.15 |
| Jones & Laughlin | Pittsburgh, Pa.* | 10.0 | 2.50 | 0.65 |
| Kaiser Steel | Fontana, Calif. | 4.0 | 1.0 | 0.30 |
| Lone Star Steel | Dangerfield, Tex. | 1.0 | 0.25 | 0.06 |
| National Steel | Weirton, W. Va. | 8.0 | 0.95 | 0.50 |
| Pittsburgh Coke & Chemical | Neville Island, Pa. | 5.0 | 1.40 | 0.40 |
| Republic Steel | Cleveland, O.* | 17.2 | 3.50 | 0.70 |
| Sharon Steel | Fairmount, W. Va. | 0.7 | 0.17 | 0.05 |
| Tennessee Products & Chem. | Chattanooga, Tenn. | 0.8 | 0.25 | 0.05 |
| United States Pipe & Foundry | Birmingham, Ala. | 3.0 | 0.80 | 0.20 |
| United States Steel | Pittsburgh, Pa.* | 54.9 | 10.0 | 3.0 |
| Wheeling Steel | E. Steubenville, W. Va. | 4.8 | 1.0 | 0.2 |
| Woodward Iron & Steel | Woodward, Ala. | 2.7 | 0.65 | 0.2 |
| Youngstown Sheet & Tube | Youngstown, O.* | 8.8 | 2.0 | 0.5 |
| | Total | 180.7 | 36.22 | 10.15 |

## Merchant Coke-Oven Aromatics Producers and Light Oil Distillers

| | | | | |
|---|---|---|---|---|
| Allied Chemical | New York, N. Y.* | 8.0 | 1.9 | 0.5 |
| Alabama By-Products | Tarrant, Ala. | 2.4 | 0.8 | 0.3 |
| Diamond Alkali | Painesville, O. | 0.5 | 0.2 | 0.05 |
| Du Pont | Belle, W. Va. | 1.0 | 0.2 | 0.05 |
| Great Lakes Carbon | St. Louis, Mo. | 0.8 | 0.13 | 0.03 |
| Indiana Gas & Chemical | Terre Haute, Ind. | 0.5 | 0.25 | 0.05 |
| Milwaukee Solvay | Milwaukee, Wis. | 1.5 | 0.25 | 0.06 |
| Wyandotte Chemicals | Wyandotte, Mich. | 0.6 | 0.15 | 0.05 |
| Eastern Gas & Fuel Assn. | Everett, Mass. | 1.7 | 0.3 | 0.08 |
| Koppers | Pittsburgh, Pa.* | 3.5 | 0.65 | 0.15 |
| American Cyanamid | Boundbrook, N. J. | 5.5 | 0.90 | 0.20 |
| Penna. Industrial Chem. | Clairton, Pa.* | — | — | — |
| | Total | 26.0 | 5.73 | 1.52 |

*Home office

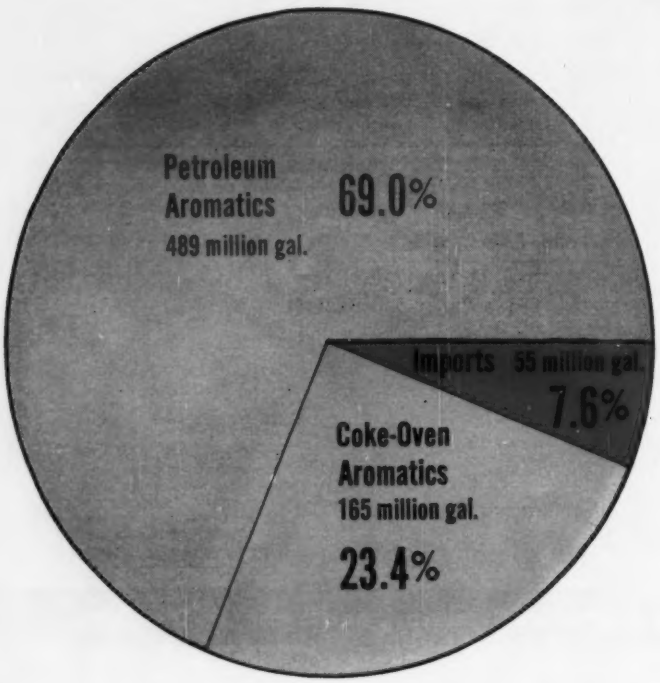
in this end-use is not expected to increase at all. If this were not the case, however, benzene demand in nylon manufacture would probably double to 50-60 million gal./year by '68, following the projected growth of nylon. But as matters now stand, benzene marketers will likely see only a steady 30-million-gal./year consumption rate, with little change anticipated.

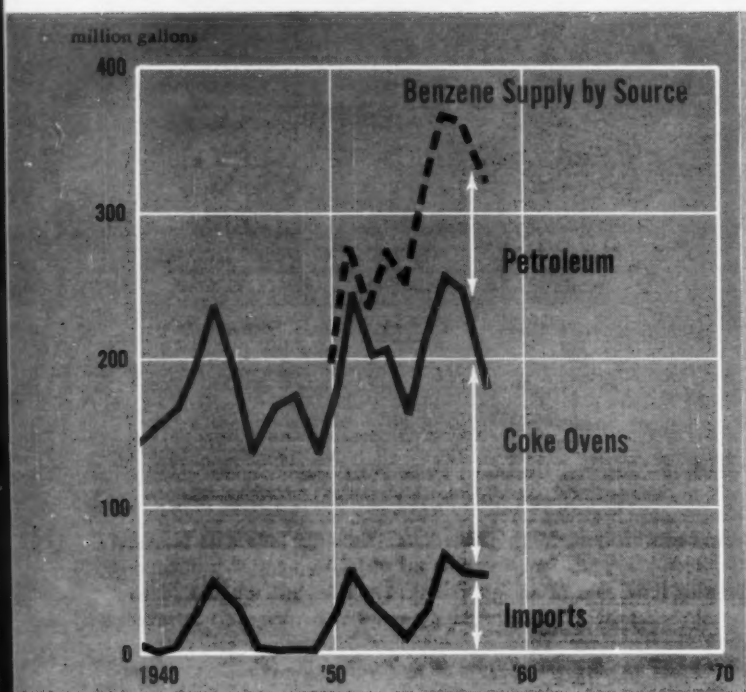
**Smaller Markets Growing, Too:** Maleic anhydride offers the most promise of all the remaining benzene markets. Although little data is available on maleic anhydride production, various estimates put it at 50 million lbs./year—which means a benzene demand of 7-8 million gal./year.

Maleic anhydride is a key intermediate in polyester and alkyd resin

# *Aromatics Source Breakdown for 1958**

**preliminary estimate*




| | Imports | Coke Ovens | Petroleum | Total (cumulative) |
|---|---|---|---|---|
| | | (million gallons) | | |
| 1940 | 3 | 138 | — | 141 |
| 1941 | — | 157 | — | 157 |
| 1942 | 3 | 162 | — | 165 |
| 1943 | 33 | 163 | — | 199 |
| 1944 | 54 | 179 | — | 233 |
| 1945 | 33 | 157 | — | 190 |
| 1946 | 2 | 137 | — | 139 |
| 1947 | 1 | 168 | — | 169 |
| 1948 | 2 | 174 | — | 176 |
| 1949 | 3 | 133 | — | 136 |
| 1950 | 23 | 164 | 10 | 197 |
| 1951 | 60 | 183 | 33 | 276 |
| 1952 | 35 | 165 | 35 | 235 |
| 1953 | 21 | 188 | 63 | 272 |
| 1954 | 13 | 149 | 91 | 253 |
| 1955 | 32 | 184 | 99 | 315 |
| 1956 | 70 | 184 | 112 | 366 |
| 1957 | 55 | 190 | 116 | 361 |
| 1958 (est.) | 55 | 125 | 145 | 325 |

*Sources:* U.S. Tariff Commission; Sun Oil Co.

manufacture. Reinforced polyester resins are used for small boat hulls, flat and corrugated structural panels, automobile accessories, radomes and home appliances—outlets with big potential growth.

Polyester demand is expected to at least double its present 100-million-lbs./year market by '68. Benzene demand will increase accordingly in this end-use, to about 20 million gal./year.

**Prices Drop Sharply:** During World War II, benzene prices were fixed at 15¢/gal. A sharp upturn in chemicals demand in the postwar period drove prices up to a peak 40¢/gal. for coke-oven benzene and to more than 50¢/gal. for the petroleum-derived product. As new petroleum benzene producers built capacity, benzene prices dropped sharply (*see graph, p. 70*) until they matched coke-oven prices in '55.

In effect, petroleum producers had wiped out the high value of petroleum-derived benzene. Recently, another 4½¢/gal. price slash was initiated by a Gulf Coast producer. All benzene producers shortly followed suit. Today's price is 31¢/gal. It's unlikely that future price cuts will expand benzene uses further.

### Toluene, Too, Has Problems

Last year, the petroleum industry supplied an estimated 170 million gal. of toluene—84% of the total volume produced. Coke ovens supplied the 16% remainder—32 million gal. Toluene demand is currently pegged at 181 million gal./year, but toluene capacity is 362 million gal./year (89% of it in the petroleum industry). In-place capacity is probably sufficient to meet predicted demand well into '68, when the toluene market is expected to reach 243 million gal./year—34% higher than today's level.

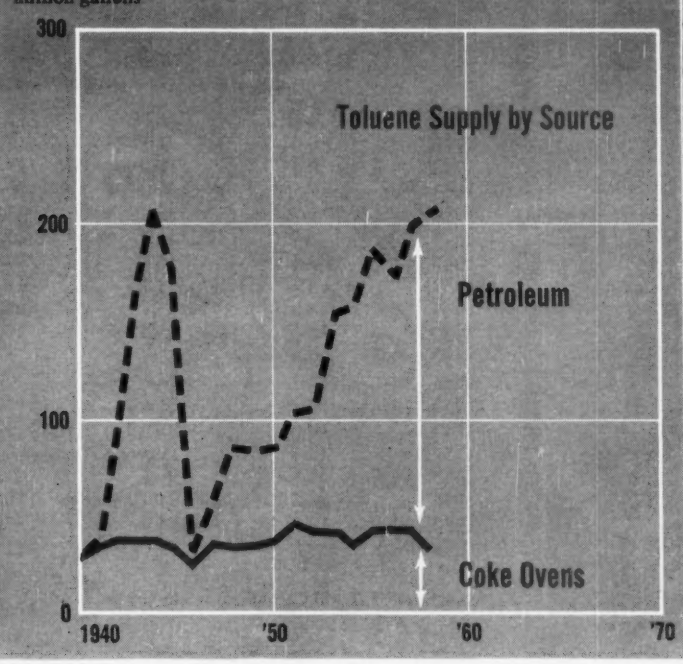
**Where Toluene Goes:** Although the market for toluene isn't as diverse as for benzene, end-use patterns are more difficult to construct. Reason: many petroleum companies make captive use of toluene for motor and aviation gasoline manufacture. About two-thirds of the toluene sold last year was for solvent uses and as an octane-booster in aviation and automobile gasolines. These prime outlets are likely to remain the largest toluene consumers for some time (*see table, p. 58*).

Bulk usage of toluene in aviation gasoline production is not expected to grow in the next 10 years. That's because jet-powered aircraft are rapidly replacing piston engines in all types of military aircraft, as well as civilian transports. The long-term outlook for toluene in avgas is for a static, if not declining, market.

Premium motor fuels took an estimated 45 million gal. of toluene last year—a rough estimate, since little data is available on this end-use. Based on available information, however, a 75-million-gal./year demand for toluene for motor gasoline may occur as predicted. This outlook is clouded by many process companies' research to find cheaper, more efficient octane improvers. Moreover, the advent of a large market for economical U.S.-made cars could even further retard the growth of toluene for motor gasoline.

**Solvent Toluene Shaky:** During the war, when toluene was allocated for military uses, solvents consumers were forced to turn to substitutes. As a result, toluene producers had trouble winning back their former solvents markets after allocations were lifted.

About 25 million gal./year of toluene are consumed as solvent for paints, varnishes, lacquers and other




| | Coke Ovens (million gallons) | Petroleum (million gallons) | Total (cumulative) (million gallons) |
|---|---|---|---|
| 1940 | 30 | 0.1 | 30 |
| 1941 | 34 | 4 | 38 |
| 1942 | 38 | 56 | 94 |
| 1943 | 38 | 125 | 163 |
| 1944 | 38 | 166 | 204 |
| 1945 | 34 | 145 | 179 |
| 1946 | 24 | 10 | 34 |
| 1947 | 33 | 27 | 60 |
| 1948 | 34 | 50 | 84 |
| 1949 | 34 | 48 | 82 |
| 1950 | 38 | 46 | 84 |
| 1951 | 46 | 56 | 102 |
| 1952 | 41 | 64 | 105 |
| 1953 | 41 | 116 | 157 |
| 1954 | 36 | 123 | 159 |
| 1955 | 42 | 143 | 185 |
| 1956 | 43 | 131 | 174 |
| 1957 | 43 | 155 | 198 |
| 1958 (est.) | 32 | 170 | 202 |

*Sources:* U.S. Tariff Commission; Sun Oil Co.

surface coatings—products that follow slow growth trends in the surface-coatings industry. The '68 demand for toluene solvent is conservatively estimated at 30 million gal.

**Toluene Intermediate Prospects:** Some 36 million gal./year of toluene are consumed in the production of dyes, intermediates, drugs, explosives and plastics. These outlets will likely more than double their demand for the material in the next 10 years.

TNT producers are the largest single users of toluene as an intermediate. They consume about 10 million gal./year now, but this market may sag 20% by '68. Reason: TNT explosives are being replaced by newer, more powerful explosives and propellents.

The fastest-growing chemical end-use for toluene is plastics, which, optimistically, may absorb some 25 million gal./year by '68, up 316% from current use (6 million gal./year). Tolylene diisocyanates and methyl styrene-derived polymers will figure prominently in the lineup.

Most promising of the toluene-based plastics are the polyurethanes—tolylene diisocyanates. The resins are converted into flexible and rigid foams, as well as synthetic elastomers. Estimates show that the current 30-40-million-lbs./year polyurethane market could grow to 300 million lbs./-year by '68. This prediction assumes that polyurethanes will make more rapid inroads into the foam rubber market than they are now making. It also assumes that producers will bring polyurethane prices down by effecting large-scale economies in manufacture.

If the rigid polyurethane foams break into construction markets as insulations and structural members, a large market will undoubtedly develop. Synthetic elastomers derived from diisocyanates (called Vulkollans) are now commercial in Germany. Producers tout high abrasion-resistance and long life for the product in auto tires and shoe heels. Obstacles to diisocyanate elastomer growth: they're costly and need cost-cutting improvements in processing to make them fully competitive with other synthetics sold for the same purposes.

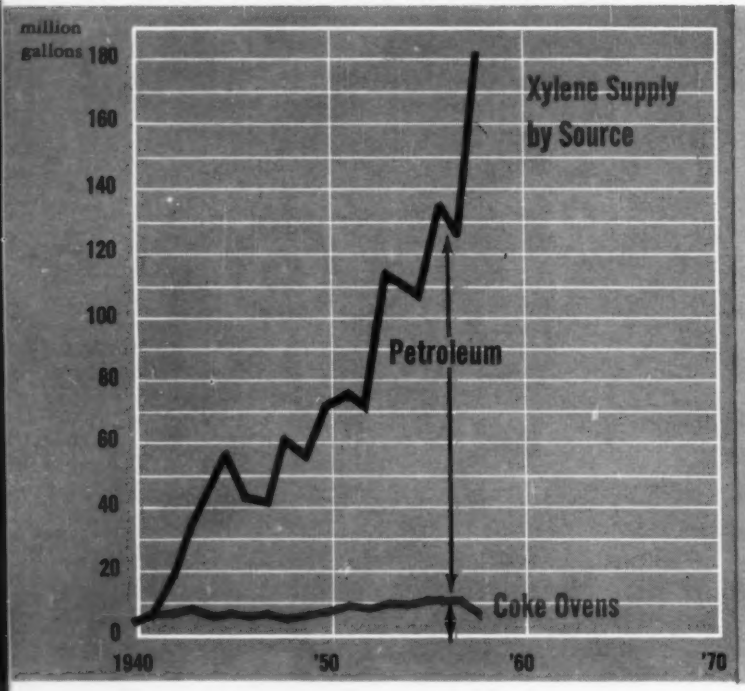
**Toluene Pricing Change:** The price history of petroleum-derived and coke oven-grade toluene is shown in the table on p. 70. After World War II, a period of rapid price fluctuation set in and toluene prices did not stabilize until after the Korean War started.

After Korea, toluene prices held steady at 34¢/gal. for the petroleum grade and 32¢/gal. for the coke-oven product. In April '58, however, toluene prices were cut to 25¢/gal., delivered, for both petroleum and coke-oven products.

The price cut was deeper than 7-9¢/gal. for the producer, since the pricing method was changed from an f.o.b. basis to a delivered basis. Some toluene marketers claim this was done to make toluene more competitive with solvent substitutes for toluene. Needless to say, the gap between capacity and demand will remain as a formidable price-depressing factor for several years.

### Xylene Follows the Pattern

Until '55, xylene capacity and supply were in fair balance. Soon afterward, however, new petroleum aromatics capacity came onstream fast, putting xylene capacity far above actual needs. Today's xylene capacity-supply-demand picture looks like this: capacity — 284.7 million gal./year (96% in the petroleum industry); supply—182 million gal./year; '58 demand—145 million gal./year. Petro-




| | Coke Ovens | Petroleum | Total (cumulative) |
|---|---|---|---|
| | (million gallons) | | |
| 1940 | 5.6 | — | 5.6 |
| 1941 | 8.6 | — | 8.6 |
| 1942 | 9.3 | 10.0 | 19.3 |
| 1943 | 10.5 | 20.0 | 30.5 |
| 1944 | 8.7 | 39.1 | 47.8 |
| 1945 | 9.5 | 46.4 | 55.9 |
| 1946 | 8.1 | 36.8 | 44.9 |
| 1947 | 8.3 | 33.1 | 41.4 |
| 1948 | 8.0 | 53.1 | 61.1 |
| 1949 | 8.2 | 49.4 | 57.6 |
| 1950 | 9.5 | 62.4 | 71.9 |
| 1951 | 11.3 | 64.4 | 75.7 |
| 1952 | 10.2 | 61.6 | 71.8 |
| 1953 | 10.6 | 102.9 | 113.5 |
| 1954 | 10.4 | 99.7 | 110.1 |
| 1955 | 11.8 | 96.1 | 107.9 |
| 1956 | 12.2 | 124.1 | 136.3 |
| 1957 | 12.0 | 115.0 | 127.0 |
| 1958 (est.) | 8.0 | 174.0 | 182.0 |

*Sources:* U.S. Tariff Commission; Sun Oil Co.

chemical producers have been the major xylene supply source since '42 and will remain so.

As with toluene, xylene's two principal markets are solvents and avgas (*see table of xylene end-uses, p. 58*). Combined, both markets consume about 100 million gal./year of xylene, divided equally between them. Xylene producers can expect little growth in these areas. Reasons are much the same as for toluene.

Xylene's most promising market is in dibasic acid production. Phthalic anhydride, isophthalic and terephthalic acids are key products to watch in following xylene growth. Dibasic acid production now accounts for about 15 million gal./year of total xylene demand. By '68, increased dibasic acid demand should boost xylene consumption to 60 million gal./year — a 205% increment.

Phthalic anhydride, key dibasic acid used for alkyd resin and plasticizer production, is made mostly fron naphthalene, but some oxidized xylenes are also consumed.

Isophthalic acid (produced entirely from xylene) should find favor with alkyd resin producers because it forms tough, flexible films even when low-cost formulations are used. But to win out over phthalic annydride in this market, isophthalic acid must overcome P.A.'s long-established use, a large captive P.A. capacity among the major paint producers and some degree of difficulty in producing isophthalic-based alkyds in existing equipment.

Isophthalic acid will probably find wider use among specialty plasticizer manufacturers looking to make plasticizers with improved volatility, compatibility and low-temperature-flex properties—features desirable in polyvinyl chloride manufacture.

The polyester resin growth pattern will affect isophthalic growth and, hence, xylene demand. Polyesters made from isophthalic have higher molecular weights, greater flex over a wide range of styrene dilutions and higher impact strengths than polys made from phthalic anhydride.

Terephthalic acid figures prominently in polyester fiber and film production. It should remain the No. 1 choice among dibasics for polyester fiber and film manufacturers for a long time. However, new polymers based on other polyols and iso-terephthalic acid mixtures are coming.

Dibasic acid producers include: Hercules (capacity—12 million lbs./year); Oronite (capacity—65 million lbs./year); Amoco (capacity—60 million lbs./year); Du Pont (capacity—150 million lbs./year). Hercules and Du Pont produce terephthalic only.

Total xylene demand for all end-uses should grow to 205 million gal./year by '68—a 29% hike over today's demand. Current xylene capacity is already ample to fill '68 needs.

**Xylene Prices Suffering:** Up until recently, petroleum xylene sold for 34¢/gal., while coke-oven xylene sold for 32¢/gal.; differences were generally due to the higher quality of the petroleum-grade product.

Faced with growing overcapacity and declining prices for benzene and toluene, xylene producers were unable to fight the downward xylene price trend. Late in Aug. '58, xylene prices dropped 5¢/gal. Tough competition from xylene substitutes for solvent uses had a hand in the price pressure. In sum, xylene is in much the same boat as toluene, price-wise.

### New Developments Afoot

Coke-oven aromatics producers are continuing to upgrade the quality of their BTX output to compete on an equal footing with petroleum-derived aromatics. U.S. Steel and Jones &

## *Meet the Authors*

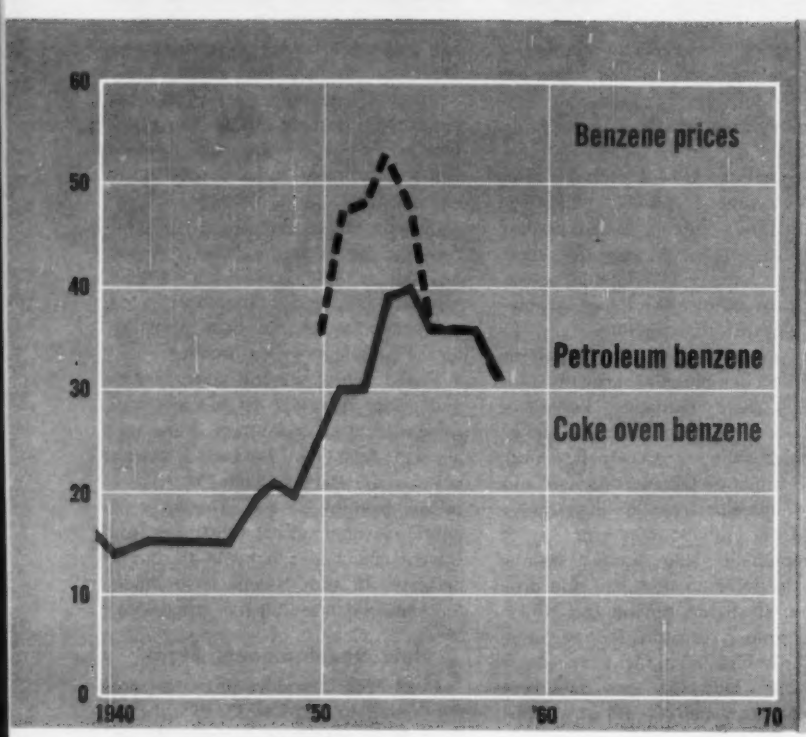
*Neil Hansen (B.A., '54; B.S. in Chem. Eng., '55—Columbia University), senior author of this* Chemical Week *report, is a business associate of coauthor Deane Groves (B.S. in Chem. Eng., '41—Rutgers University), supervisor of Sun Oil Co.'s commercial chemical development group.*

*Hansen began his business career in Sun's research and development department, later transferred to commercial chemical development, where he researches current supply-demand-capacity situations.*

*Groves' background includes evaluation, development and sale of chemical products. He has spent much time in finding new uses for old patents. As coauthor, he contributes data obtained through several years of studies of the BTX situation.*

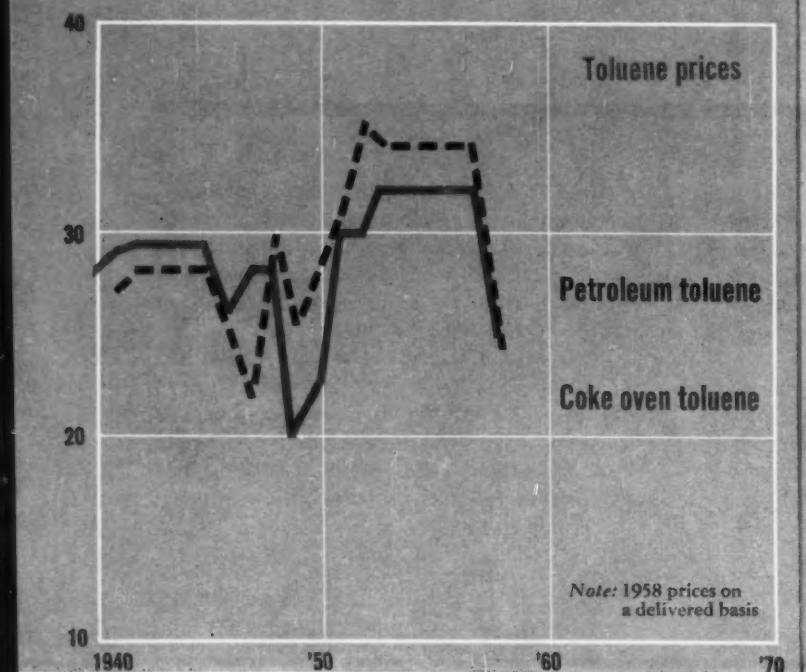
*Their aromatics report is the result of a cooperative Sun Oil-*Chemical Week *effort to give the CPI the facts, figures and trends behind today's BTX overcapacity dilemma. Aim: to put aromatics producers into a better position to close the market gap.*

# *Toppling BTX Prices*




| | Coke Oven | Petroleum |
|---|---|---|
| | (Cents/gallon) | |
| 1940 | 16 | — |
| 1941 | 14 | — |
| 1942 | 15 | — |
| 1943 | 15 | — |
| 1944 | 15 | — |
| 1945 | 15 | — |
| 1946 | 15 | — |
| 1947 | 19 | — |
| 1948 | 21 | — |
| 1949 | 20 | — |
| 1950 | 25 | 36 |
| 1951 | 30 | 47 |
| 1952 | 30 | 48 |
| 1953 | 39 | 53 |
| 1954 | 40 | 48 |
| 1955 | 36 | 36 |
| 1956 | 36 | 36 |
| 1957 | 36 | 36 |
| 1958 | 31 | 31 |

*Source:* Oil, Paint & Drug Reporter




| | Coke Oven | Petroleum |
|---|---|---|
| | (Cents/gallon) | |
| 1940 | 28 | — |
| 1941 | 29 | 27 |
| 1942 | 29.5 | 28 |
| 1943 | 29.5 | 28 |
| 1944 | 29.5 | 28 |
| 1945 | 29.5 | 28 |
| 1946 | 26 | 25 |
| 1947 | 28 | 22 |
| 1948 | 28 | 30 |
| 1949 | 20 | 25 |
| 1950 | 22.5 | 28 |
| 1951 | 30 | 30.5 |
| 1952 | 30 | 35 |
| 1953 | 32 | 34 |
| 1954 | 32 | 34 |
| 1955 | 32 | 34 |
| 1956 | 32 | 34 |
| 1957 | 32 | 34 |
| 1958 | 25 | 25 |

*Source:* Oil, Paint & Drug Reporter

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Laughlin hydrogenate light oil and extract BTX by the Udex (UOP) process.

Improvements in blast furnace operation and iron ore preparation have reduced coke requirements in steelmaking from 1,900 lbs./ton of metal to 1,730 lbs./ton. Introducing oxygen into the blast furnace, and sintering, nodulizing and pelletizing of ores are responsible for the gain.

Some steel companies claim that there's no room left for further improvements in coke usage, while others say that coke consumption will be lowered still further, to 1,500 lbs./ton of metal by '68. This means there's still a possibility that coke-oven aromatics production will increase at a slower rate than predicted. If so, petroleum producers will gain.

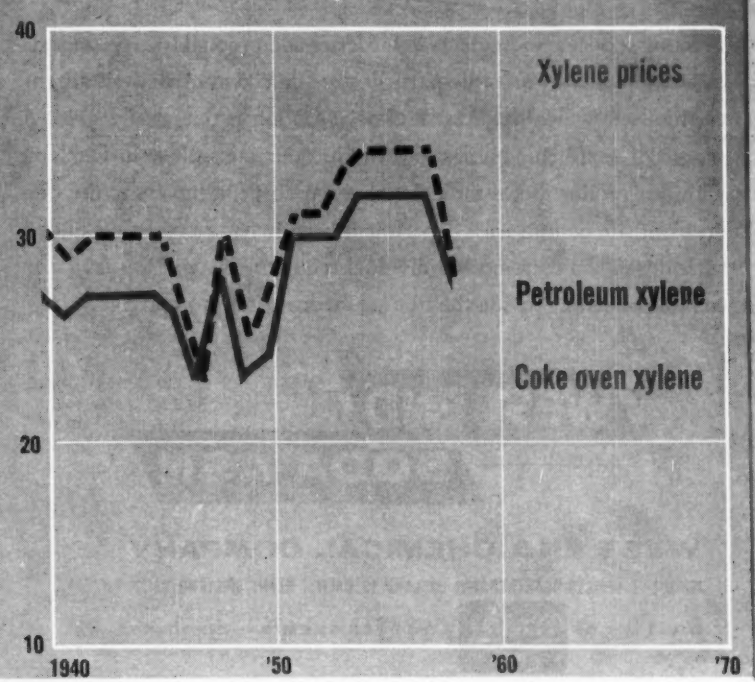
Direct reduction of iron ore with hydrogen would require no coke whatsoever, hence would produce no aromatic by-products. All the major steel companies are pilot-planting direct reduction processes, but it will be many a year before they commercialize their findings.

Several petroleum companies are now separating xylenes either for sale or for captive production of dibasic acids. Cosden Petroleum separates ethylbenzene from mixed xylenes by superfractionation, uses it for captive styrene manufacture. Cosden's process poses a potential threat to producers who market benzene for styrene manufacture by conventional alkylation and dehydrogenation methods. No other oil companies, however, have announced intentions of following in Cosden's path.

What happens in the plastics market will, to a large extent, determine the future of BTX. Polystyrene and phenolic resins are big benzene consumers now. Nylon-6, epoxies and polycarbonates, potentially big BTX customers, all face tough competition from non-BTX-based products such as high-density polyethylene, polypropylene and polyesters.

BTX producers must step up end-use research and development projects if they expect to ease the BTX overcapacity problem. That holds particularly for toluene and xylene producers who must face the fact that the three biggest toluene and xylene markets—motor gasoline, avgas and solvents—will remain relatively static in the next 10 years.

Prospects of making higher profits and bigger sales by selling aromatics to the chemical intermediate and plastics markets should induce BTX producers to undertake more end-use research and product development, especially when sagging BTX prices and millions of gallons of idle BTX capacity is the alternate prospect.




| | Coke Oven | Petroleum |
|---|---|---|
| | (Cents/gallon) | |
| 1940 | 27 | — |
| 1941 | 26 | 29 |
| 1942 | 27 | 30 |
| 1943 | 27 | 30 |
| 1944 | 27 | 30 |
| 1945 | 27 | 30 |
| 1946 | 26 | 26 |
| 1947 | 23 | 23 |
| 1948 | 28 | 30 |
| 1949 | 23 | 25 |
| 1950 | 24 | 28 |
| 1951 | 30 | 31 |
| 1952 | 30 | 31 |
| 1953 | 30 | 33 |
| 1954 | 32 | 34 |
| 1955 | 32 | 34 |
| 1956 | 32 | 34 |
| 1957 | 32 | 34 |
| 1958 | 28 | 28 |

*Source:* Oil, Paint & Drug Reporter

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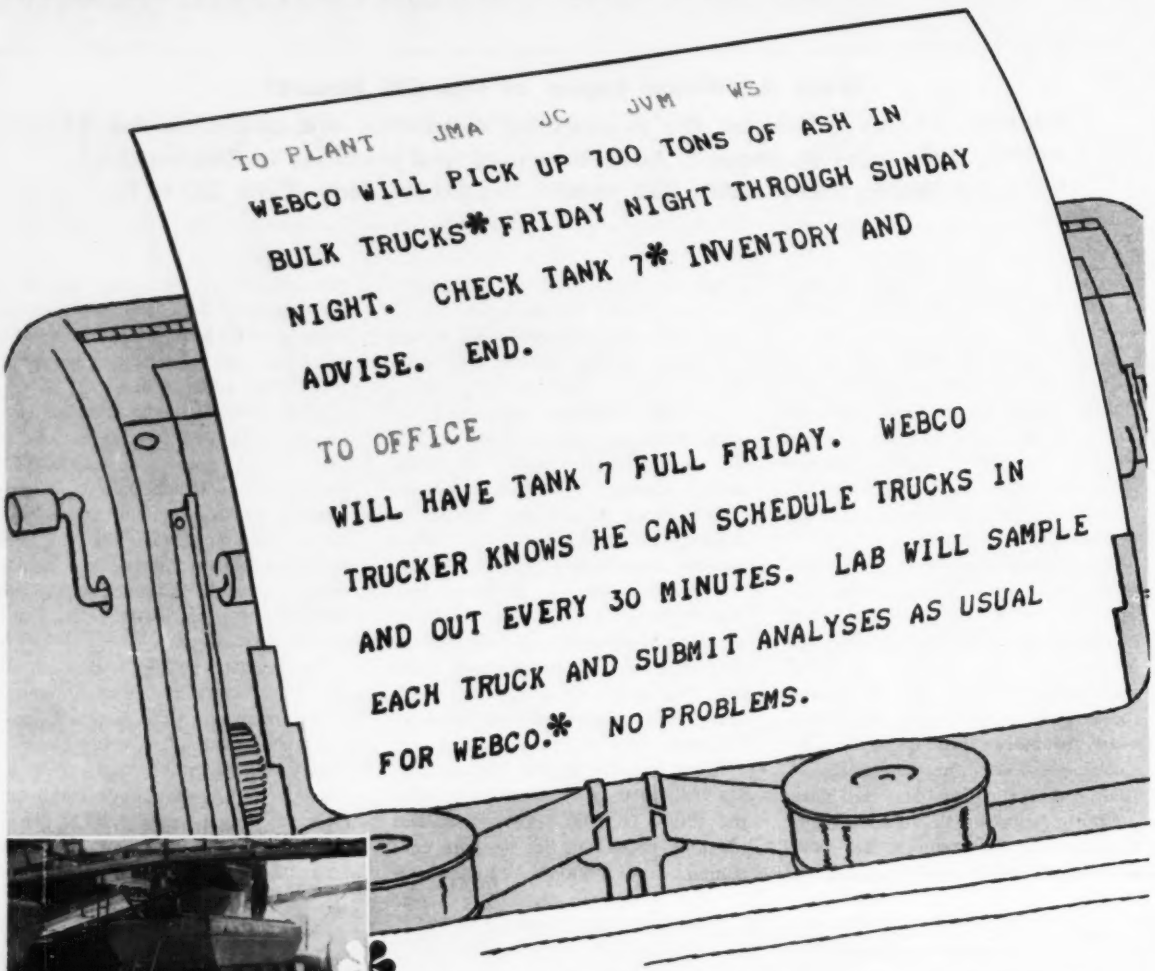
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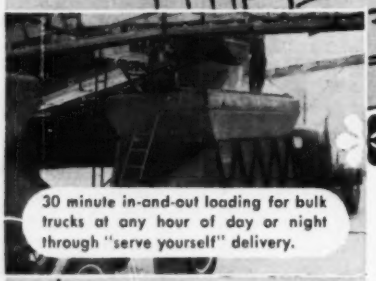

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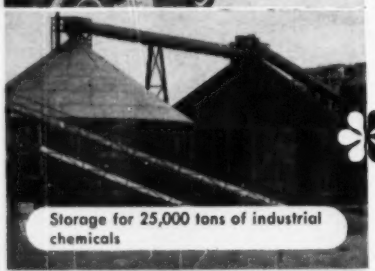

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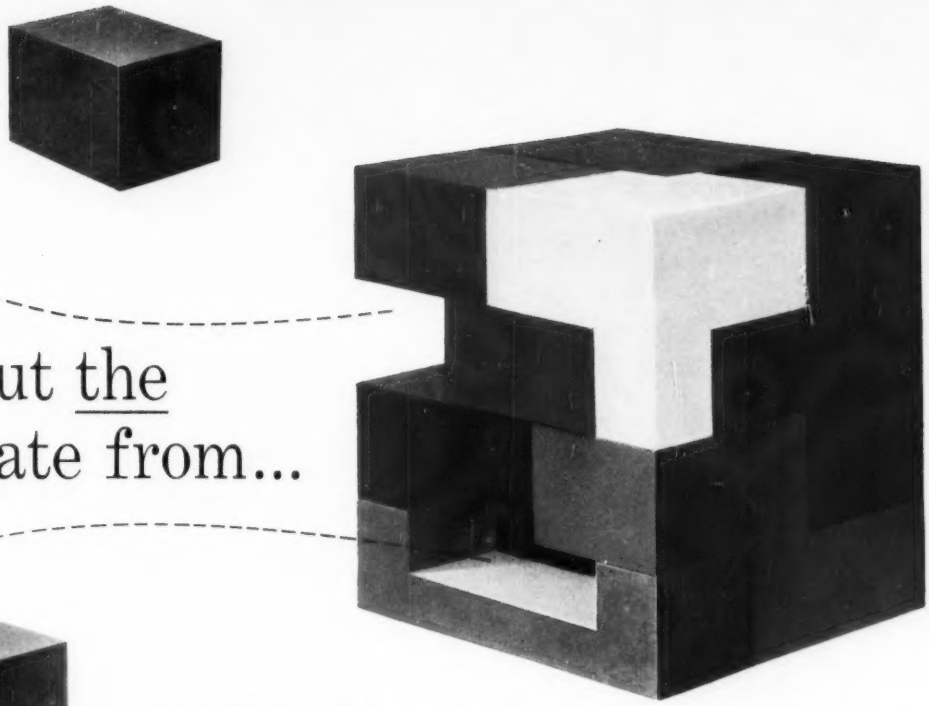

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| | Bryton Sherosope T | 500 | 62 |
| | Bryton BOSS® 470 | 460 | 70 |
| | Brylite® 460 | 460 | 62 |
| *Barium Sulfonates* | Bryton Hybase® Barium Sulfonate 65 Base No. | 1010 | 47 |
| | Bryton Barium Sulfonate 30-N 2 Base No. | 1010 | 30 |
| *Calcium Sulfonates* | Bryton Calcium Sulfonate 30-A | 900 | 30 |
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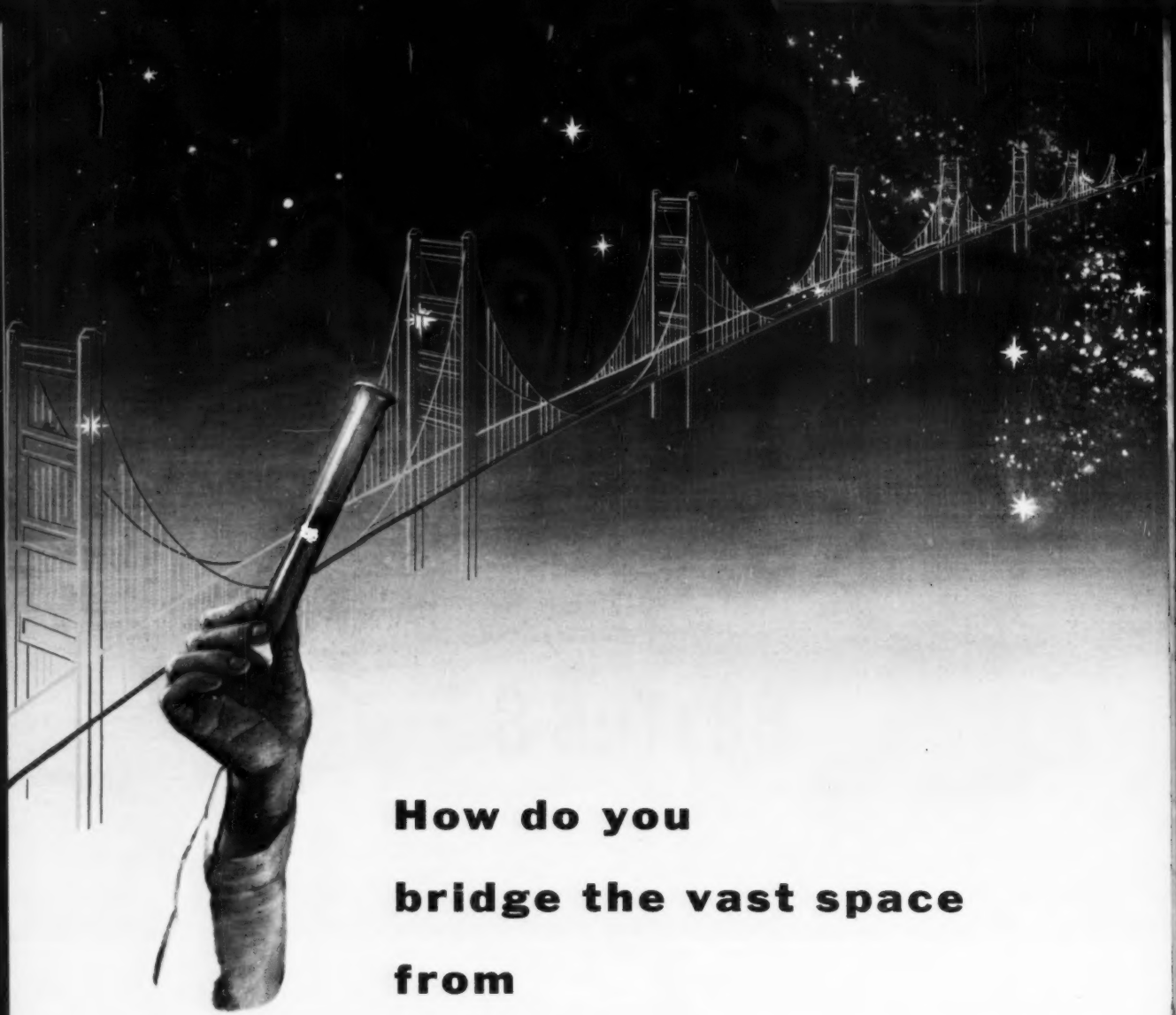

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# Slim Look Fattens Sweetener Sales

**After 17 years of patent control of the cyclamate sweetener market, Du Pont is now less in command. The basic patent on its cyclamate sweeteners (U. S. Patent 2,275,125) expires this week, which leaves the field open to any would-be cyclamate specialty makers. And the 10% climb in cyclamate sales in '58 makes the field look tempting at first glance.**

Currently, only Du Pont and its licensee, Abbott Laboratories (Chicago), are turning out the cyclamates. The patent expiration is sure to heighten their competition—but rivalry from new producers will be slow in coming. The reason is simply that despite steadily growing sales, cyclamate demand is still low. Sales of synthetic sweeteners for food processing may this year hit $3-4 million. Retail sweeteners are in the $15-17-million bracket—and cyclamate claims less than half this field.

According to Abbott, first in the cyclamate field (1950) with its heavily promoted Sucaryl, there's no cyclamate supply shortage now, and there's not likely to be one in the foreseeable future. "Our cyclamate capacity,"

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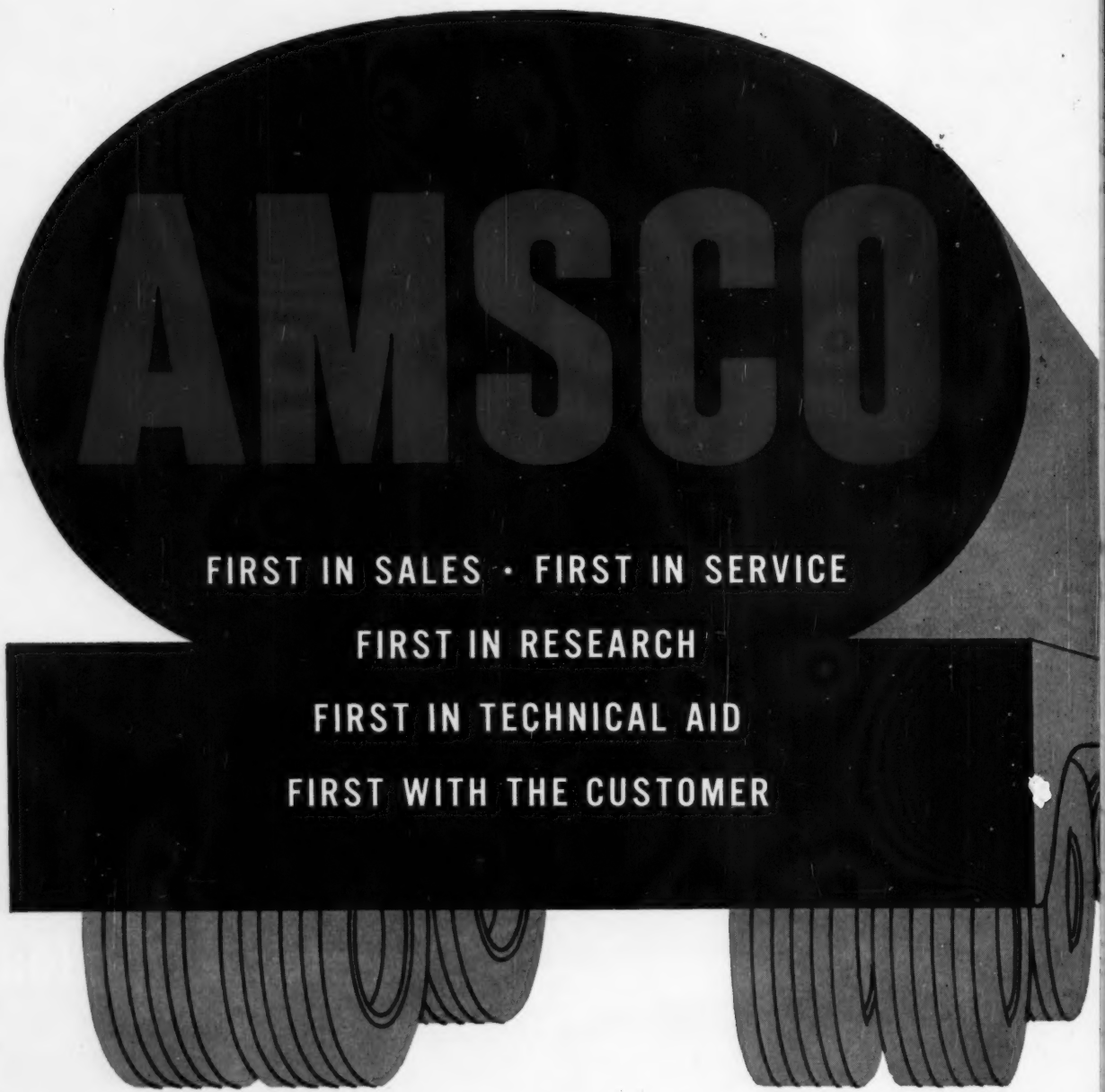
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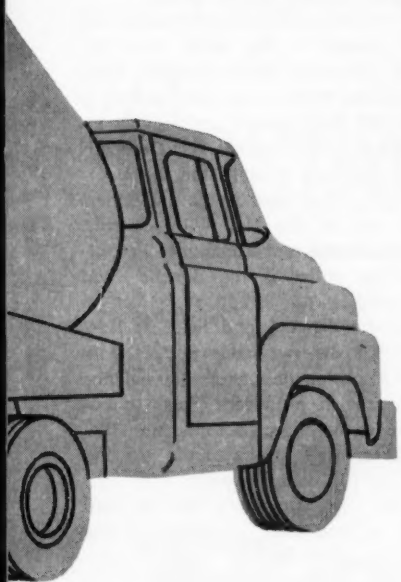

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says an Abbott spokesman, "is large enough to handle all the U.S. cyclamate needed." Although Abbott is reluctant to hand out figures on its cyclamate production, it will say that it has about $1 million invested in cyclamate equipment. "The only effect that the runout of Du Pont's patent will have on us," says Abbott, "is that we won't have to pay royalties any longer." Abbott was never given an exclusive cyclamate process license by Du Pont.*

Users of Cylan (Du Pont's cyclamate tradename) and Sucaryl, aren't likely to start turning out their own cyclamate either. The manufacture still takes a lot of quality control, know-how, and specialty equipment, and the low-volume needs of individual customers makes captive production uneconomical.

A little sweetener goes a long way. Usual concentration of cyclamate used in carbonated beverages (cyclamate has been cleared by the Food and Drug Administration under its new food additives law), for example, is 0.2%-0.3%. In canned fruit, sweetener concentration may vary from 0.06%-0.3%. And, in the meat field, just one pound of cyclamate is enough to treat 10,000 lbs. of bacon.

Toughest cyclamate competition for U.S. producers may come from foreign companies. Japan, Sweden, Denmark and Holland are now turning it out, but they haven't aggressively invaded the U.S. market yet. Competition could get rough in the future.

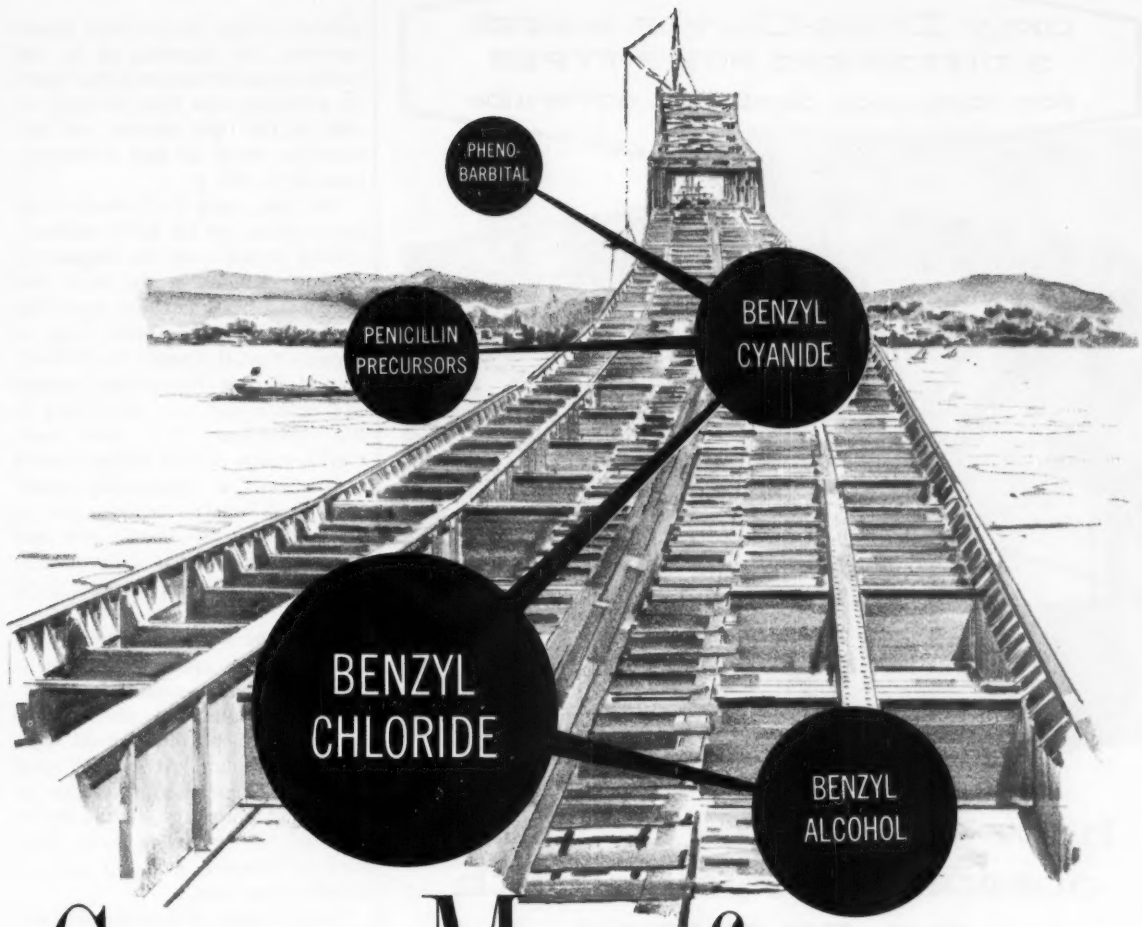
**Table Use Tops:** Table sweeteners still rate as the No. 1 outlet both for saccharin and cyclamate. Fastest-growing outlet is the dietetic food market.†

In the dietetic food field, at least 90% of the sweetener market now goes to cyclamate makers, the balance to saccharin producers. Sales of cyclamate are expected to be up 10% this year, largely due to the growing market for dietetic foods.

Just why cyclamate has retained such a lead over saccharin in the dietetic food field is hard to say. Claims of bitter aftertaste and heat

* Although Du Pont has held the basic cyclamate patent since '42, it didn't start making the material until '55, five years after Abbott began production. Du Pont continues to hold a few of the use and process patents in the cyclamate field, but these patents aren't important enough for Du Pont to maintain its hold on the cyclamate market.

† Both sodium and calcium cyclamates are used, although the calcium salt is generally preferred for dietetic products.

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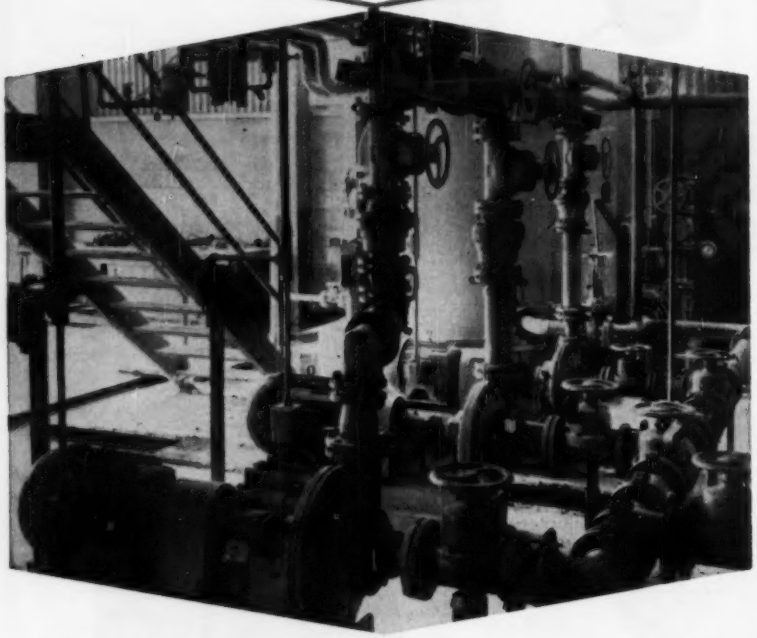

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instability, once big criticisms against saccharin, are beginning to die out. Saccharin makers maintain that there's no aftertaste when their products are used in the right amount and that saccharin stands up well at temperatures up to 600 F.

This year, sales of all dietetic foods are expected to hit $252 million—10-fold growth over '50. Biggest cyclamate end-uses in the food field are canned fruits and soda pop. Sales of dietetic beverages alone (such as Kirsch's No-Cal, Canada Dry's Glamor and Pabst's Tap-A-Cola) topped $17 million last year. According to Richmond-Chase Co. (San Jose, Calif.), maker of Diet Delight canned fruits, "sales of synthetically sweetened fruits total 4 million cases a year." Makers of dietetic pop and canned fruits told *CW* sales of their products would be up at least 10% this year.

**Saving the Bacon:** A development that may give cyclamate makers a boost is cyclamate-cured bacon. According to Du Pont and Abbott, it may be a big commercial item in the near future. At least 20 meat packers are now using cyclamate in bacon and practically all the major meat packers (including Swift, Rath Packing, Hormel, Cudahy) are researching the idea.

Bacon is cured with sweeteners, not for dietetic reasons but because they cut down smoke in frying. The curing process has already been o.k.'d by the Dept. of Agriculture and treated bacon doesn't need a dietetic label, as do all other food items using no-calorie sweeteners.

**Sweetening Edge:** Even though cyclamate sweeteners are showing the biggest sales growth, in pound volume, the leader is saccharin (it was Monsanto's first chemical product, in 1901). One reason: lower cost. In bulk, saccharin sells for $1.60-$1.65/-lb.; cyclamate, $1.95-$2/lb.

In '57, saccharin and cyclamate makers turned out over 2 million lbs. of synthetic sweeteners. According to Sugar Information, Inc. (New York), the sugar equivalent of this 2 million lbs. of saccharin and cyclamate is about 250,000 tons. (Saccharin is about 300 times sweeter than sugar, cyclamate about 30 times sweeter.)

Because of a growing amount of imported saccharin, price of U. S. materials may drop further. Mon-

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Vopcolene Division, Los Angeles—Emery Industries (Canada), London, Ontario Export Department, Cincinnati

DOW | **NEWS BRIEFS** *that plant profit seeds*

**Alert chemical processors are watching for two kinds of news these days. News about new chemical developments and news about new uses for established chemicals. They can often spot idea seeds that grow into profit blooms when nourished by decisive, intelligent action. These two pages present, in concise form, news about several Dow chemicals . . . worthwhile reading for C.P.I. men on the lookout for ideas.**

**You may wish to check certain items in this advertisement and forward to those concerned in your company.**

**ROUTE TO:**

_____

_____

_____

_____

# DOWICIDE: LIFE PRESERVER FOR PRODUCTS AND PROFITS

**An axiom of modern marketing is: "Make it better, sell it better!" Certainly one of the world's best sales stimulators is product improvement. But once you've improved the product, how do you keep it that way?**

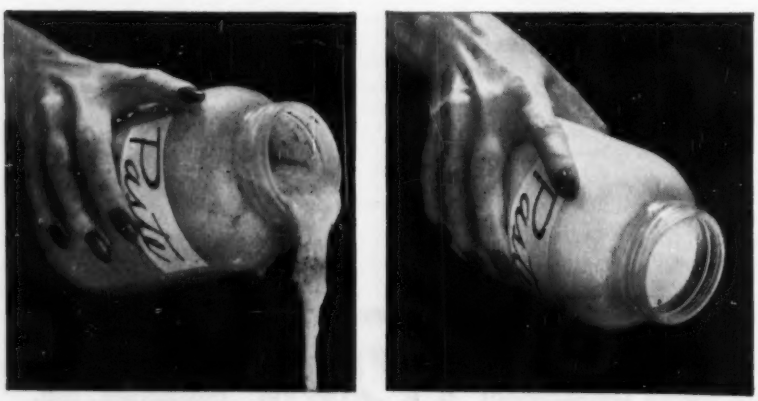
That's where Dowicide® comes in. The manufacturer of a new liquid starch faced up to the "keeping" problem. His new synthetic starch lasts so long in shirts, linens and the like (up to 8 washings) that a bottleful would last much longer, too. This *could* mean trouble . . . decomposition caused by bacteria and fungi. He brought the problem to Midland, where Dow researchers recommended the addition of Dowicide A to his formula. Happy result: the attack by destructive bacteria and fungi was prevented by the chemical curtain of Dowicide A.

**14 different Dowicide** preservatives provide product quality "insurance" against the ravages of time, molds, bacteria. They keep shoe polishes polishing, floor waxes waxing, and baler twine tough and tight. One of the Dowicide preservatives protects apples, pears and citrus fruits on the journey from tree to table. Losses from decay due to bacteria are cut by 65% or more, even on transoceanic shipments!

A manufacturer of fine carpeting found that twisted cellulose twine makes an ideal carpet backing, but it must be protected from attack by mildew. A Dowicide preservative does the job well for just a few cents per yard. Dowicide preservatives also guard quality in textiles, ceramics, leather, paper, paint, agricultural and building products.

**Performance tests** with library paste graphically illustrate the value of Dowicide preservatives. Two samples (see photo) were inoculated with microorganisms and exposed for one week at a temperature of 86°F. The untreated sample showed mold growth and developed an objectionable odor. The sample treated with a Dowicide preservative resisted attack, retained its consistency and other characteristics.

Most manufacturers and processors who have had experience with Dowi-



Untreated sample of library paste (left) shows spoilage resulting from mold attack. Sample at right, treated with Dowicide, remains clean and useful.

**DOW CHEMICALS** *basic to the*

Alkylene Oxides, Glycols • Industrial Preservatives • Polyalkylene Glycols • Glycol Ethers • Alkalies • Phenolic Compounds • Brominated and Chlorinated Aliphatic Compounds • Inorganic Acids • Halogens • Organic Acids and

**THE DOW CHEMICAL COMPANY**
**Midland, Michigan**

cide make it a point to check with Dow whenever they're making a change in a product or working on a new one. That's the best time to find out which Dowicide preservative will best do the product protection job required. If you'd like more information about Dowicide preservatives, write to the address below for literature and data.

## Gum with no "gel out"

News about Methocel® is making quite a stir in the C.P.I. these days. This non-ionic, water-soluble gum has more applications in chemical processing than a cat has lives.

**Wide line widened.** Three new Methocel types, 60 HG, 70 HG and 90 HG have recently joined the ranks to supplement the already extensive Methocel family. Together, they give the chemist an unparalleled selection of thickeners, emulsifiers, stabilizers, binders and suspension agents.

Methocel 90 HG is available in a wide range of viscosities including a super-high 15000 cps material for exceptionally high thickening efficiency. The 90 HG type, developed for its non-gelling characteristics, is useful where elevated processing temperatures are encountered . . . polymer processing for example. Solutions of Methocel 90 HG retain their functional properties up to 194°F. At this temperature they may lose some clarity which is restored on cooling.

**Fact-filled book.** The new formulations and viscosities, as well as simplified techniques to put Methocel into solution, are described in the recently published Methocel manual. This colorful 60-page reference book contains a large section on applications, 13 useful charts and a complete bibliography.

★ ★ ★ ★

**New ideas anyone? If you'd like to know more about the Dow chemicals discussed on these pages, or those listed in the box below, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Chemicals Sales Department 916AM3-7**

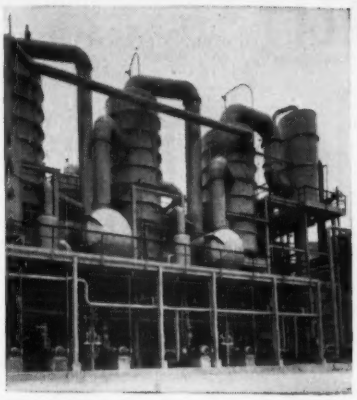
*chemical processing industries*

Esters • Inorganic Chlorides • Bromides and Bromates • Nitrogen Compounds • Amino Acids • Glycerine • Salicylates • Phenyl Phosphates • Heat-Transfer Media

DOW

## GOOD SIGN:

### *Caustic on the march*



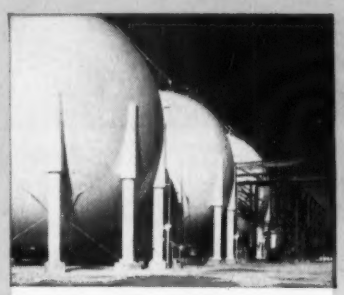
New facilities supplement Dow nationwide caustic soda distribution network.

The national consumption of caustic soda—traditionally a reliable economic barometer—is being watched more closely now than ever before. This holds particularly true in the chemical process industries where a large percentage of the total caustic tonnage is used. An encouraging side light is the new activity at Dow these days . . . activity that has a bearing on future caustic indices.

**Add Plaquemine.** Dow is forging new links in its far reaching chain of distribution centers for caustic soda. A new producing plant at Plaquemine, Louisiana, is scheduled to go on stream soon. Other new terminal points have been added, bringing the total to eight. Twelve Dow producing points and shipping terminals are strategically located to give C.P.I. customers throughout the nation the best possible break on their freight dollar.

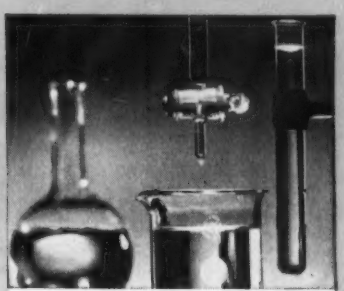
## FAST FACTS

### about 4 more Dow chemicals



**AMMONIA**

Huge inventories maintained by Dow assure abundant supply . . . several shipping terminals guarantee prompt delivery.

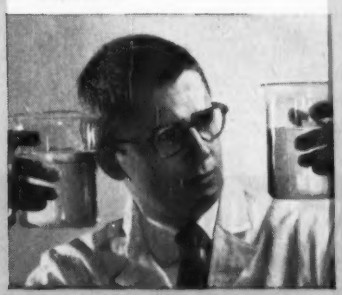


**DOWANOL®**

Dow offers only line including both ethylene and propylene glycol ethers . . . the right solvent for many applications in chemical processing.

**ETHANOLAMINES**

Crystal clear and pure . . . improve cosmetics, shampoos, waxes and liquid buffing compounds. Eliminate problems in gas sweetening and dehydration.

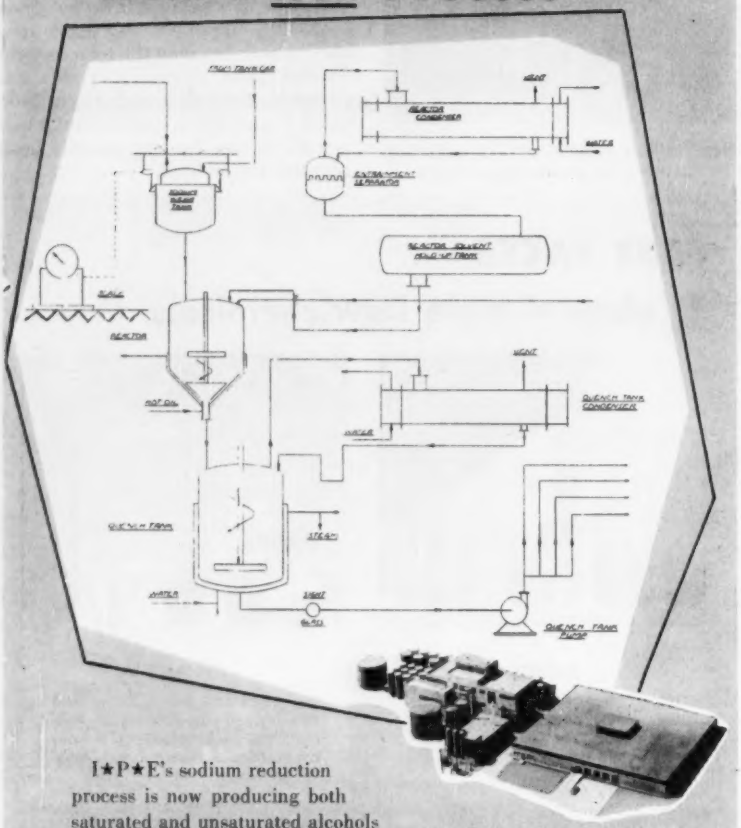


**ETHYLENE AND PROPYLENE OXIDE**

Upgrade products with these two versatile Dow chemicals . . . receive them from either of two shipping points, whichever is most convenient.

# New Fatty Alcohols

## from a New Process



I★P★E's sodium reduction process is now producing both saturated and unsaturated alcohols that have never before been commercially available. The flow sheet shows the principal equipment in the reactor system, which is designed for maximum safety, as well as efficient operation, high yields and product flexibility. Plants are designed for large volume runs of a variety of oils, as well as for semi-commercial and pilot batches of special oils.

For further details on this process, or any fatty alcohol plant, contact I★P★E's Process Plants Division. Dept. J.

I·P·E REACTION ENGINEERED PROCESS

INDUSTRIAL PROCESS ENGINEERS

12 LISTER AVENUE • NEWARK 5, N. J.




santo, the largest saccharin maker, produces about two-thirds of total U. S. output. Maumee Chemical (Toledo, O.) turns out the remaining one-third of the material. During '58, over 200,000 lbs. of saccharin were imported in the U. S. Great bulk of this material comes from the Netherlands, smaller quantities from Switzerland and Japan. On the East Coast, imported saccharin sells for $1.35-$1.53/lb., compared with the U. S. price of $1.60/lb. Although Monsanto hasn't yet reduced its saccharin price, it told *CW* that if imports continue to increase, price drops are sure to come.

**Slimming Down:** In the retail field, saccharin probably has the edge over cyclamate in package unit sales, although sales of combination cyclamate-saccharin sweeteners are moving up fast. Formulations consist of cyclamate with a small amount of saccharin, permitting more concentrated use of synthetics, with reduced effect of aftertaste. One result has been a reduction in the potential market (in pound volume) for cyclamates.

A survey by E. R. Squibb and Sons, division of Olin Mathieson Chemical Corp., shows that combination cyclamate-saccharin products account for two-thirds of the total sweetener dollar volume sold in drugstores. At least 80% of table sweeteners are sold in drugstores, the remaining 20% in supermarkets and department stores.

Consumers' use ratio of cyclamate to saccharin varies from 20 parts cyclamate and 1 part saccharin to 4 parts cyclamate and 1 part saccharin. Ratio most often used, however, is 9 parts cyclamate to 1 part saccharin. Abbott's Sucaryl (it has 60% of the sweetener market in drugstores), Squibb's New Sweeta and Rexall's Table Sweet, all combination cyclamate-saccharin products, are the top-selling table sweeteners.

Straight-saccharin products are marketed by dozens of companies, many of them small local concerns. The price of straight-saccharin products varies widely. A bottle of 1,000 saccharin tablets costs 29¢ to $1.59. On the other hand, cost of combination products is fairly steady — a bottle of 1,000 tablets retails for $3.84.

**Drug Demand:** Second-biggest outlet for saccharin is the health and beauty fields, with toothpastes, mouth-

# IS YOUR FILE UP TO DATE?

If you use any of these chemicals, you'll want Allied's latest technical, price and delivery information on them. To get it, just call or write your nearest Nitrogen Division branch office. Or simply check right on this ad the materials of interest to you, clip it to your letterhead and mail to Nitrogen Division's New York headquarters.

**ANHYDROUS AMMONIA** — This basic industrial chemical is available in commercial and refrigeration grades from three strategically located plants.

**AQUA AMMONIA ($NH_4OH$)** — An economical source of nitrogen and an easily handled alkali.

**AMMONIUM NITRATE** — In pelleted form. Typical analysis: Ammonium Nitrate content — 96% or more.

**AMMONIUM SULFATE** — Diverse uses include fireproofing, fertilizers, leather tanning.

**NFS-83 and NFS-50**—Ammonium nitrate-water solutions containing respectively 83% and 50% $NH_4NO_3$. For explosives, fluid catalysts, pharmaceutical applications.

**ETHYLENE OXIDE** — Rocket propellant, fumigant, fungicide, chemical intermediate.

**ETHYLENE GLYCOL** — Also DI- and TRI-. Humectants, plasticizers, scrubbing solutions for gas dehydration, scores of other industrial uses.

**ETHANOLAMINES**—MEA, DEA and TEA. Versatile, reactive, easy to handle. TEA available in 98% and commercial grades.

**FORMALDEHYDE** — Available as 37% Inhibited, 37% Low-Methanol, 45% Low-Methanol, 50% Low-Methanol.

**METHANOL** — In barge, tank car and tank truck quantities, all 99.85% pure.

**NITROGEN TETROXIDE**—High energy oxidant for liquid rocket propellants. Easy to handle and store.

**SODIUM NITRATE** — Three grades — coarse, medium, fine — to meet exacting process requirements. 99.5% pure.

**UREA** — Multiplant production assures unfailing supply of this basic chemical in crystal and pelleted form.

**U-F CONCENTRATE-85** — Highly concentrated solution of urea (25%) and formaldehyde (60%). Easy to handle, economical source of these materials for resins and adhesives.

*Branch Offices:* Atlanta 3, Ga. • Chicago, Ill • Cleveland 15, Ohio • Columbia, Mo. • Columbia 1, S. C. • Hopewell, Va. • Indianapolis 20, Ind. • Ironton, Ohio • Kalamazoo, Mich. • Los Angeles 5, Cal. • New York 6, N. Y. • Omaha 7, Nebr. • Orange, Texas • San Francisco 4, Cal. • St. Paul 4, Minn.

**NITROGEN DIVISION**
Dept. AP 8-7-4 40 Rector Street, New York 6, N.Y.

Allied Chemical

washes and pediatric drugs leading. In the pharmaceutical field, saccharin probably beats out cyclamate in sales. At least 200 different drug products use synthetic sweeteners. Other large saccharin outlets include the metal plating industry, where saccharin is used as a plating agent; for sweetening tobacco, envelope flap glues, and dietetic foods.

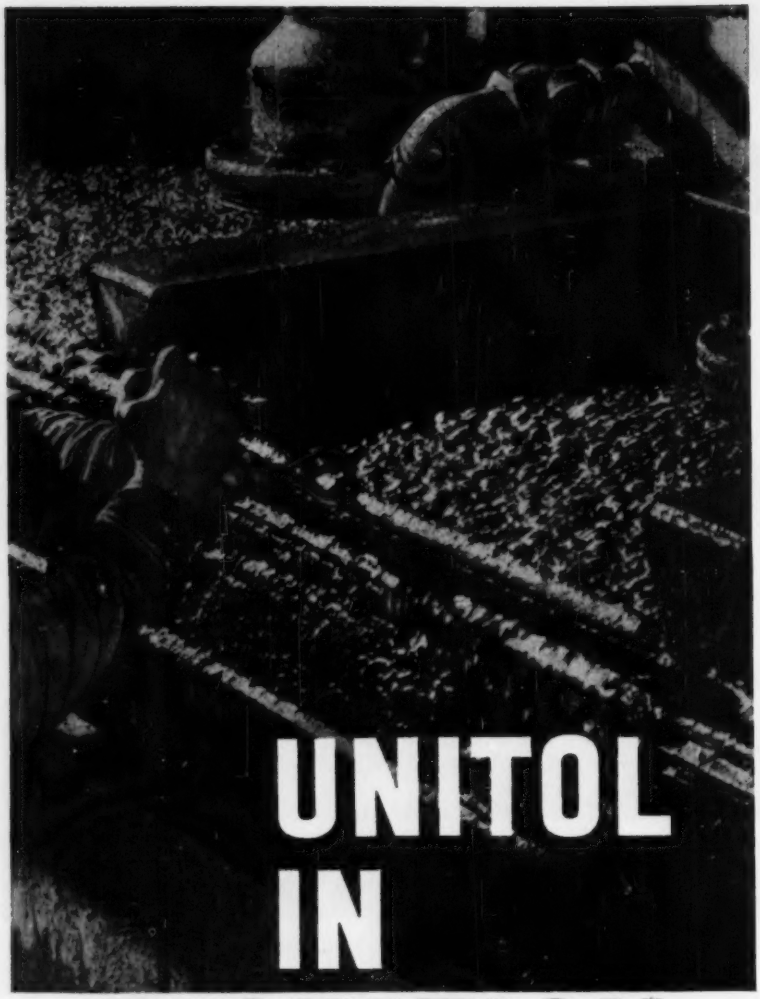
Although Monsanto reports that its saccharin sales are at a postwar high, it's quick to point out that the postwar market isn't as large as the prewar market. One big reason: saccharin exports have diminished, largely because former customer-countries are now Communist controlled. Red China, for example, once a big market for saccharin, is no longer a U. S. sweetener buyer.

**Pig Starter:** Biggest new saccharin development in the last few years has been its use in animal feeds. It is said to improve the palatability of animal feeds without producing a satiating effect, so that livestock readily increase intake of nutritive foods, fatten quicker. McKesson & Robbins (bulk seller of saccharin), especially active in this field, reports that a large number of small Midwestern feed companies are already important saccharin buyers.

**Fading 'Fatism'?** There's a trend among some companies putting out dietetic foods to get away from the overweight and/or dietetic pitch. General Foods, for example, says that dietetic connotes "fatism," so it's pushing the health and nutritive value of its dietetic line of Jello (D-Zerta) rather than the dietetic value.

No matter how they're promoted, sweeteners will be used by the same people — the overweights — and that makes the future look promising. Makers point out that there are 45-60 million diet-conscious Americans—36 million who are really overweight. About 52% of them are over 45, and 55% of them have incomes greater than $6,000/year. And there are 1 million diabetics who are big buyers of the dietetic foods.

The market will grow for the sweeteners — along with population increases — but chances are that there'll be few new faces among those who manufacture for these markets. Chances of breaking into this field look pretty slim, and those now in it will fatten on expanding markets.

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increase
mineral yields

Modern flotation techniques are helping metallurgists extend our valuable mineral reserves. *UNITOL* tall oil products are helping them do it economically.

*UNITOL* products provide a low cost source of organic fatty acids and make effective reagents for the flotation of hematite, phosphate rock and manganese. They also may be used to float many other metallic oxide minerals from apatite to zircon. Write today for information, samples and prices.

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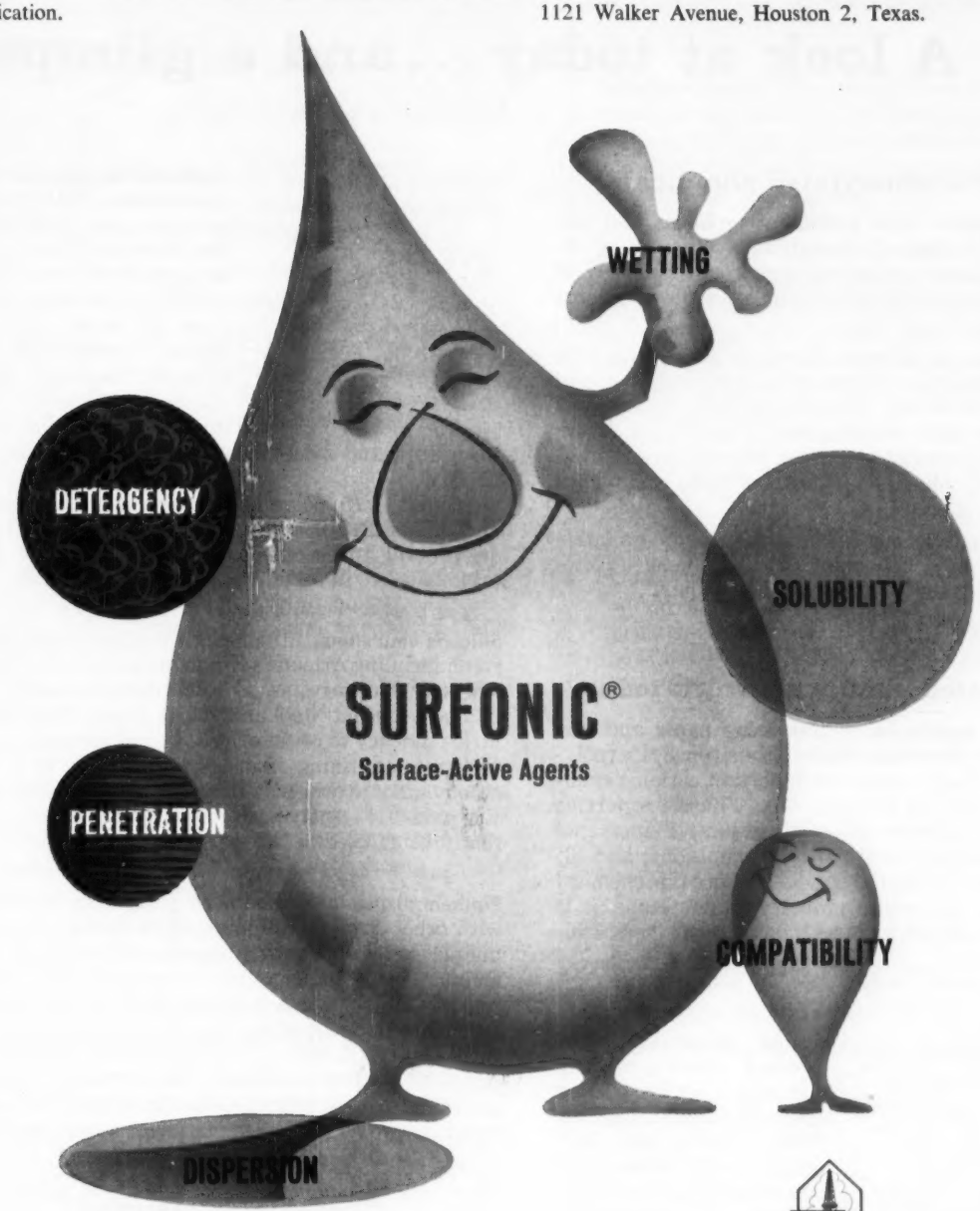
UNION BAG-CAMP PAPER
CORPORATION
233 Broadway, New York 7, N. Y.

# MEET A GOOD MIXER . . .

**Jefferson Chemical Company's SURFONIC®** surface-active agents are nonionic adducts of nonylphenol or tridecyl alcohol and ethylene oxide, designed to give you broad modification of liquid surface and interfacial tensions. With these surfactants you can effect and control a wide range of properties essential to formulation and to end product application.

Whatever your formulating problem — from concrete to cosmetics — Jefferson Chemical's versatile SURFONIC surface-active agents can give you the miscibility and wetting properties most favorable to your product or process. A comprehensive technical bulletin, "SURFONIC Surface-Active Agents," is available from Jefferson Chemical Company, 1121 Walker Avenue, Houston 2, Texas.




*Essential Chemicals From Hydrocarbon Sources*

**JEFFERSON CHEMICAL COMPANY, INC.**

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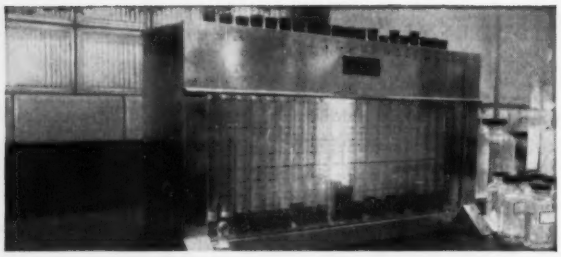
Ethylene Oxide, Glycols, Dichloride • Ethanolamines • Morpholine • Piperazine
Polyethylene Glycols • Nonyl Phenol • SURFONIC® Surface-Active Agents
Ethylene Carbonate and Propylene Carbonate • Caustic Potash • Caustic Soda
Soda Ash • Sodium Bicarbonate

109



# A look at today... and a glimpse

## Armour's ethoxylated chemicals

Most industries have surfactant problems that can be solved by Armour's versatile polyethoxylated derivatives. These compounds range from completely oil soluble to completely water soluble, and from cationic to non-ionic in activity.

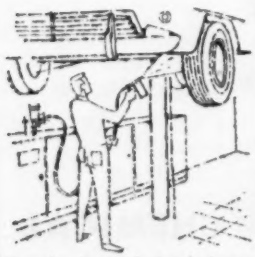
More than 40 different chemicals offer you a wide range of properties to work with in solving your own surfactant problems. This great flexibility assures you exactly the right combination for each application. And with the recent expansion of our etho-chemical unit at McCook, Illinois, prices of these compounds have been reduced.

The etho-chemicals fall into five major groups—the Ethomeens®, Ethoduomeens®, Ethomids®, Ethofats® and the newly introduced Ethoquads®.

## Where Armour's ethoxylated chemicals work today

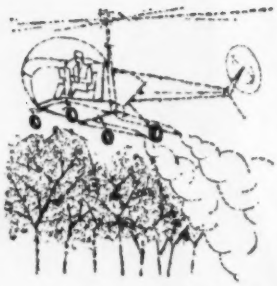
**Mineral oil emulsions.** In processing paper and textiles, three properties make Ethomeen S/15 (polyethoxylated soya amine) an important cationic emulsifying agent for mineral oils. These properties provide: (1) effective anti-static results; (2) increased ability to adjust the stability of emulsions; and (3) excellent hard water tolerance. Because this chemical provides an anti-static property to emulsions, it is especially valuable when working with wool and synthetic fibers.

*For more information, check "A" in the coupon.*



**Sound absorbers.** Improved sound-proofing compounds are being made by wetting asbestos or fiber fillers rapidly and uniformly with chemically-treated asphalt. The chemical that makes it possible is Ethoduomeen T/13 (a polyethoxylated N-tallow diamine). It's proving to be a vital ingredient in many asphalt-based undercoating materials for automobiles and in several important industrial sound-deadening compounds.

*More technical data is available. Check "B" in the coupon.*



**Agricultural emulsifiable concentrates.** Many manufacturers are discovering that non-ionic Ethofats can be combined with either anionics or cationics to produce far more efficient blends of emulsifiers. For example, improved emulsification of the oil solutions of DDT, chloradane, toxaphene, and 2-4-D is being obtained by using an Ethofat.

Ethofat C/15 (polyethoxylated coconut fatty acid) and Ethofat 242/25 (polyethoxylated rosin fatty acid) are proving to be excellent wetting agents for wettable powders in several pesticide formulations.

*Want more details? Check "C" in the coupon.*

**Silicone emulsions.** Major silicone suppliers are today recommending Armour's Ethomids as non-ionic emulsifiers for silicone resins. Ethomid emulsions are stable in both concentrated and dilute form. They show little tendency to rewet or yellow, and are compatible with most finishing resins. Ethomid HT/15 (polyethoxylated hydrogenated tallow fatty amide) and Ethomid 0/15 (polyethoxylated oleamide) are currently being used in this particular application.

*Check "D" in the coupon for more complete information.*

**Pigment dispersion.** Ethomeen S/12, when combined with other Armour cationics, offers manufacturers a unique system of coating organic and inorganic pigments. The Ethomeen greatly improves the dispersion of these pigments in paints, plastics, and rubber. Other Armour etho-chemicals also are demonstrating their ability to perform as dispersants. Because of the large number of different pigments and vehicles available, Armour welcomes the opportunity to recommend the proper etho-chemical for your requirements.

*For technical data, check "E" in the coupon.*

## Chemical structures

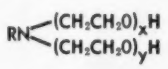
**The Ethoquads®** are a new series of polyethoxylated quaternary ammonium compounds formed by quaternization of the Ethomeens.

$$\left[ R-\overset{\displaystyle CH_3}{\overset{|}{N}}\!<\!\begin{matrix}(CH_2CH_2O)_xH\\(CH_2CH_2O)_yH\end{matrix} \right]^{+} Cl^{-}$$

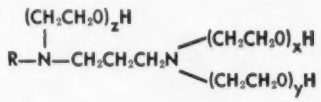
# of tomorrow

*from Armour Chemical*

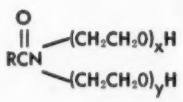
**The Ethomeens®** are prepared from n-alkyl primary amines. They have an ethylene oxide content ranging from 2 to 50 moles per mole of amine.



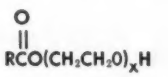
**The Ethoduomeens®**, like Ethomeens, are reaction products of amines and ethylene oxide. The difference: Ethoduomeens are obtained by the ethoxylation of n-alkyl trimethylene diamines.



**The Ethomids®** are N, N-substituted fatty acid amides. The substituents being polyoxyethylene groups. The Ethomids are chemically neutral and rather unreactive.



**The Ethofats®** are mono-fatty or rosin acid esters of polyoxyethylene glycols. These esters are fairly stable in mildly acid or alkaline solutions. They can, however, be hydrolyzed by refluxing with strong acids or alkalies.



## Armour's ethoxylated chemicals tomorrow

Armour research with the etho-chemicals finds their versatility to be virtually unlimited.

Examples: Ethomeens are suspending high density metallic fines in selected oil systems. Ethoduomeens are being evaluated as building blocks for asphalt adhesion additives and as cationic asphalt emulsifying agents. Many etho-chemicals show great promise as internal anti-static agents in polyvinyl chloride and polyvinyl acetate-polyvinyl chloride copolymers.

**Investigate the Ethoquads, Ethomeens, Ethoduomeens, Ethomids and Ethofats. Find out what they're doing in your industry. Send the coupon or call Armour today.**

## NEWS NOTES

**Chicago.** Recent modifications in pilot plant production and analytical methods now assure more uniformity in alpha sulfoalkyl acids . . . $RCH(SO_3H)COOH$. New samples of alpha sulfopalmitic and alpha sulfosteric acids are now available from Armour.

•

**Barcelona, Spain.** The first shipment of Ethomeen to this country arrived from New York. These ethoxylated aliphatic amines are finding widespread use in the country's expanding synthetic fiber industry.

•

**Akron, Ohio.** Armour's oleyl nitrile, Arneel® OD, is replacing Arneel SD (soya nitrile), as a synthetic rubber plasticizer. Recent tests show this particular Arneel offers a greatly reduced odor level, more uniform consistency and slightly improved physical properties at low temperatures.

•

**McCook, Ill.** Production of the Ethofat 142 series was recently discontinued with the introduction of Ethofat 0/15 and 0/20. In addition to the new products having equivalent emulsifying characteristics, they have a very low percentage of linoleic acid which minimizes oxidation. The Ethofat O series, unlike the Ethofat 142 series, contains no rosin acids.

**ARMOUR CHEMICAL DIVISION**

© Armour and Company

**How can the etho-chemicals help you?**

Check here for more information on your field of interest.

☐ A ☐ B ☐ C ☐ D ☐ E

Send sample for this application:

_____

_____

NAME_____

POSITION_____

COMPANY_____

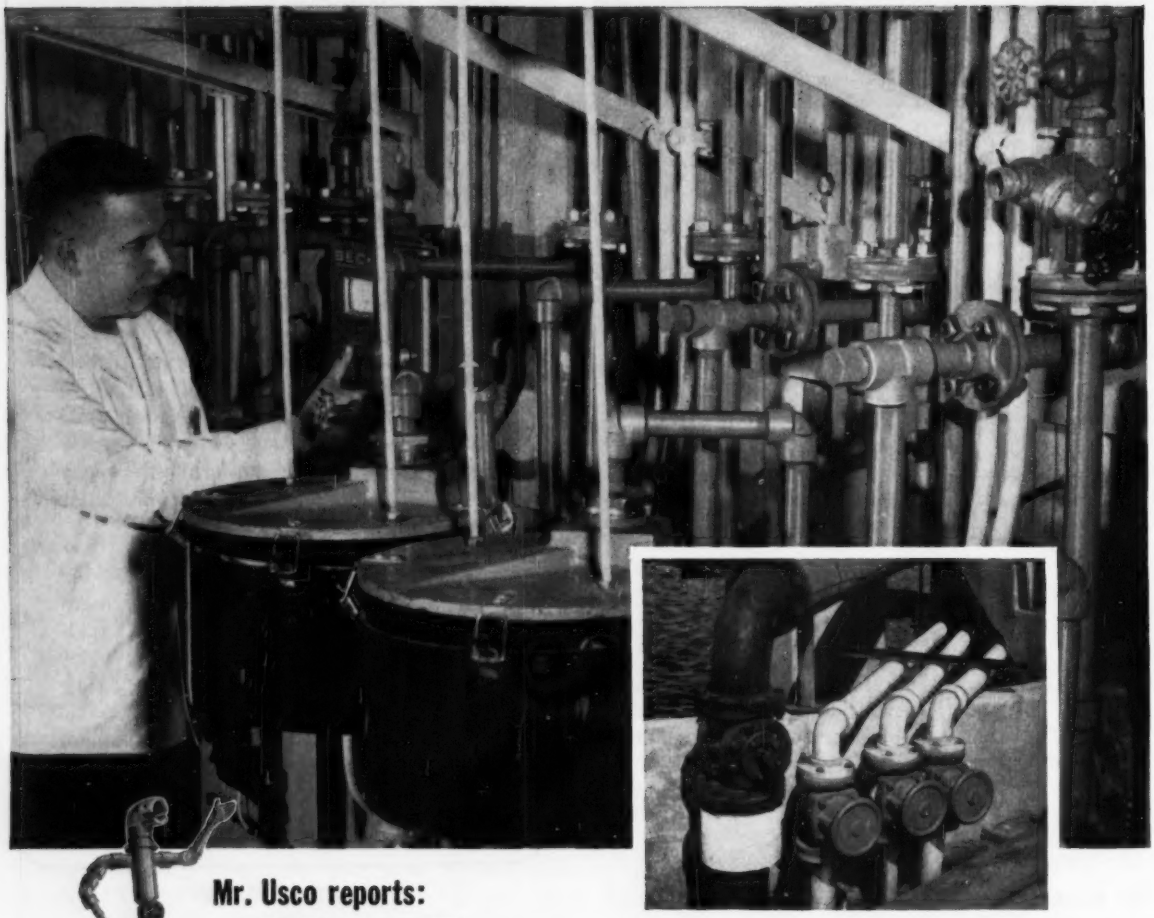
ADDRESS_____

CITY_____ STATE_____

Armour Chemical Division · 1355 W. 31st St. · Chicago 9, Ill.

(Sample offer limited to North American Continent) CW-3-59

USCOLITE PLASTIC PIPE



Mr. Usco reports:

# After 5 years, all 8 miles of Uscolite still perform perfectly

The Omaha, Neb., Waterworks formerly used metal pipe to introduce strong chemicals into the water to purify it. But the corrosive fluids ate the metal pipe, requiring pipe replacement about twice a month. Then, "U.S." plastic engineers suggested sampling a piece of ½" Uscolite® plastic pipe.

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Uscolite is deliberately engineered to handle highly corrosive fluids. It is extremely light in weight, yet has high impact strength. It imparts neither taste, odor, nor discoloration. The Uscolite line of pipe, valves and fittings is the most comprehensive plastic pipe line in America and has been awarded the National Sanitation Foundation Seal of Approval.

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# Technology Newsletter

CHEMICAL WEEK
March 7, 1959

**Total synthesis of a new biologically active compound,** a derivative of demethylchlortetracycline (DMCT), has been accomplished at Lederle Laboratories Division, American Cyanamid Co. (Pearl River, N.Y.). Lederle claims the achievement opens up pathways to new antibiotics, independent of living organisms. Lederle researchers worked three years to turn up the synthetic, which is chemically related to naturally derived broad-spectrum antibiotics—Aureomycin (chlortetracycline), Terramycin (oxytetracycline) and Achromycin (tetracycline), as well as to DMCT.

•

**Heart of Kennecott Copper's rhenium process** is spelled out this week, now that subsidiary Chase Brass has made wrought forms of the rare metal (*CW, Feb. 12, p. 68*) available. Rhenium, long known to be present in molybdenum concentrates recovered in copper production, was originally recovered from molybdenite-roasting flue dusts. Kennecott found, however, that most of the rhenium was escaping as a gas (the oxide, $Re_2O_7$, which sublimes at 450 C). Kennecott's solution: a specially designed recirculating water-spray system to recover the soluble oxide. It's then recovered from solution by ion exchange, and is further processed to high-purity ammonium perrhenate. The perrhenate is Chase's starting material.

•

**A trend to European research labs for U.S. companies?** American Cyanamid is the latest to plan a basic research unit overseas—a million-dollar lab for Lake Geneva, Switzerland. The staff, entirely foreign, will choose its own projects and modes of research; administration will be handled in the U.S. by Cyanamid. Cyanamid claims its project will be more extensive than the other U.S. labs in Europe: Smith, Kline & French's unit in Great Britain; and the labs of Stanford Research Institute, Monsanto and W. R. Grace in Zurich, Switzerland. These are, for the most part, extensions of U.S. laboratories.

•

**A new dextrinization process** that's said to produce dextrins of lighter color, "cleaner" and more uniform has been developed (U.S. Patent 2,845,368) by A. E. Staley Manufacturing Co. (Decatur, Ill.). The key: fluidization of dry, powdered starch in air to permit extremely even distribution of heat and acid. Better control of the starch-to-dextrin conversion prevents localized charring, says Staley, yields high-quality products for such uses as coatings, bag pastes and prepared adhesives in the paper industry, and print thickeners, finishing and dyeing agents in textile plants.

•

**Pollution control can be profitable,** says Simon Carves Ltd. (Stockport, England). The firm told *CW* this week that two years of large-scale pilot-plant testing have proved the technical and economic feasibility of converting sulfur oxides from flue gases into salable ammonium sulfate and high-purity sulfur.

The Simon-Carves process consists of scrubbing flue gases with ammonia liquor and autoclaving the resultant solution of ammonium salts. In tests on one boiler burning 120 tons/day of coal and producing 56,000 cu.ft./minute of flue gas, 94% of the sulfur was recovered. Sulfur concentration in the outlet gas was only 0.05 grains/cu.ft. The company is now working on a two-stage scrubbing system designed to minimize loss of ammonia from the scrubber. It estimates outlet gas will contain no more than 0.03 grains/cu.ft. of sulfur, 0.05 grains/cu.ft. of ammonia.

Economics of the process hinge on sulfur content of the fuel. The company estimates that two-stage washing of flue gases from four boilers, each burning about 400 tons/day of oil containing 3.5% sulfur, would show "very substantial profits" per ton of oil burned. Breakeven point is in the neighborhood of 1.5-2% sulfur content.

•

**A new method of making low-pressure polyethylene** has been disclosed by R. Mihail of the Roumainian Institute for Chemistry (Bucharest). It is reminiscent of some of Phillips Petroleum's early published work (*CW, May 14, '55, p. 101*) but differs in requiring no diluent (e.g., pentane or octane) for the reaction.

Mihail reports obtaining polyethylene having a molecular weight of 40,000 by passing ethylene into a polyethylene melt at 140 C and 40 atm. The melt contains a chromium oxide catalyst (on a silica-alumina carrier) activated by lithium alanate. Polymerization speed increases as the partial pressure of the ethylene and the molecular weight of the molten polyethylene are increased.

•

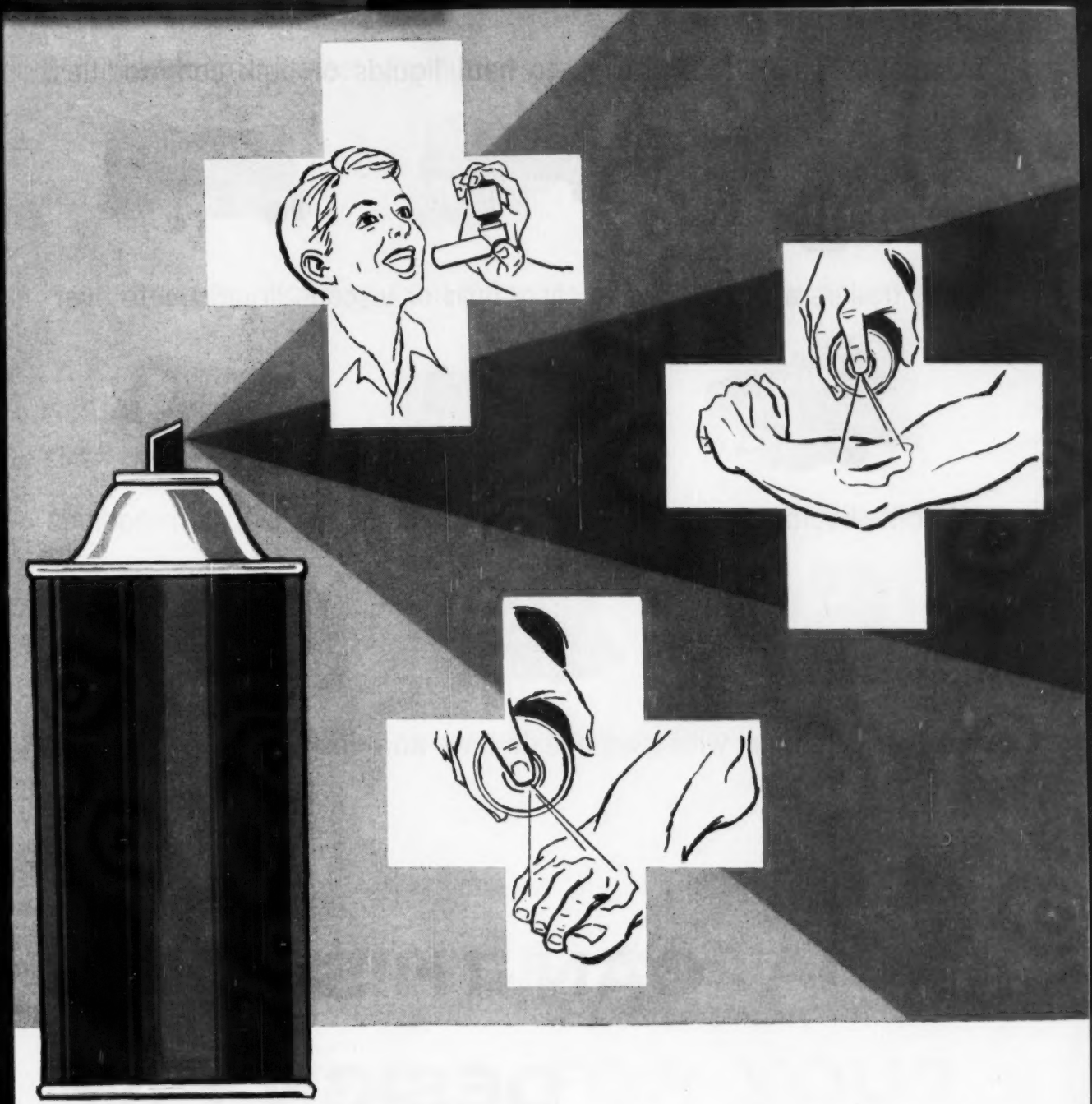
**An underwater pipeline will carry molten sulfur** from Freeport Sulfur Co.'s underwater mine at Grande Isle (*CW, June 21, '59, p. 29*) to a shore base seven miles away. There, the sulfur will be loaded into new "vacuum bottle" barges for a 25-mile inland waterway trip to Port Sulfur, La. The company decided to place a pipeline because it's relatively invulnerable to interruptions by Gulf storms that interfere with barge transportation. Work on the project is expected to begin in May.

•

**A new thermal reduction process for nuclear-grade beryllium** being installed at Imperial Smelting Corp.'s zinc plant in Avonmouth, England, is scheduled for operation by year's end. It will be Britain's first commercial source of high-purity beryllium. Capacity hasn't been disclosed, but the firm plans to build another unit if British demand for the metal reaches 100-tons/year by '65. Output is earmarked for canning nuclear fuel for high-temperature reactors (600 C).

•

**Molecular sieves can end jet flameouts** resulting from ice formation in jet aircraft fuel systems, claims Linde Co., division of Union Carbide, this week. The sieves, tested under U.S. Air Force contract at Armour Research Foundation of the Illinois Institute of Technology, extract virtually 100% of the water dissolved in jet fuel.



# Newest packaging idea in a $187,000,000 market

How big is the pharmaceutical market? In 1957, $187 million worth of drug and pharmaceutical products were sold, not including $1.7 *billion* worth of prescription items. In these markets aerosol sales are gaining rapidly. They amounted to $9.3 million in 1957, almost a 300% increase over 1956. Aerosols have made a major breakthrough in pharmaceuticals after revolutionizing sales for hair fixatives, colognes, insecticides and a host of other products.

The reasons for this success are simple. Aerosols deliver the product in a completely new form that's easier, more effective and often more economical to use. If your product can be brushed, poured or sprayed, you stand a good chance to add new sales appeal—create vast new markets—if you package it in an aerosol.

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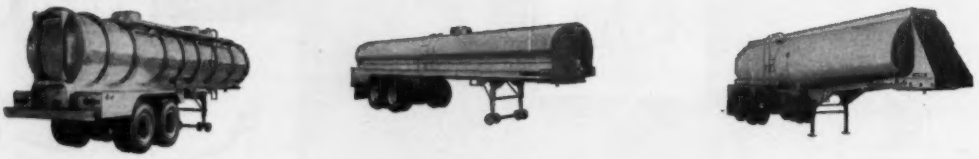

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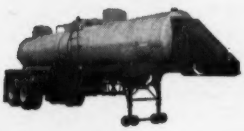

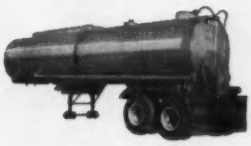

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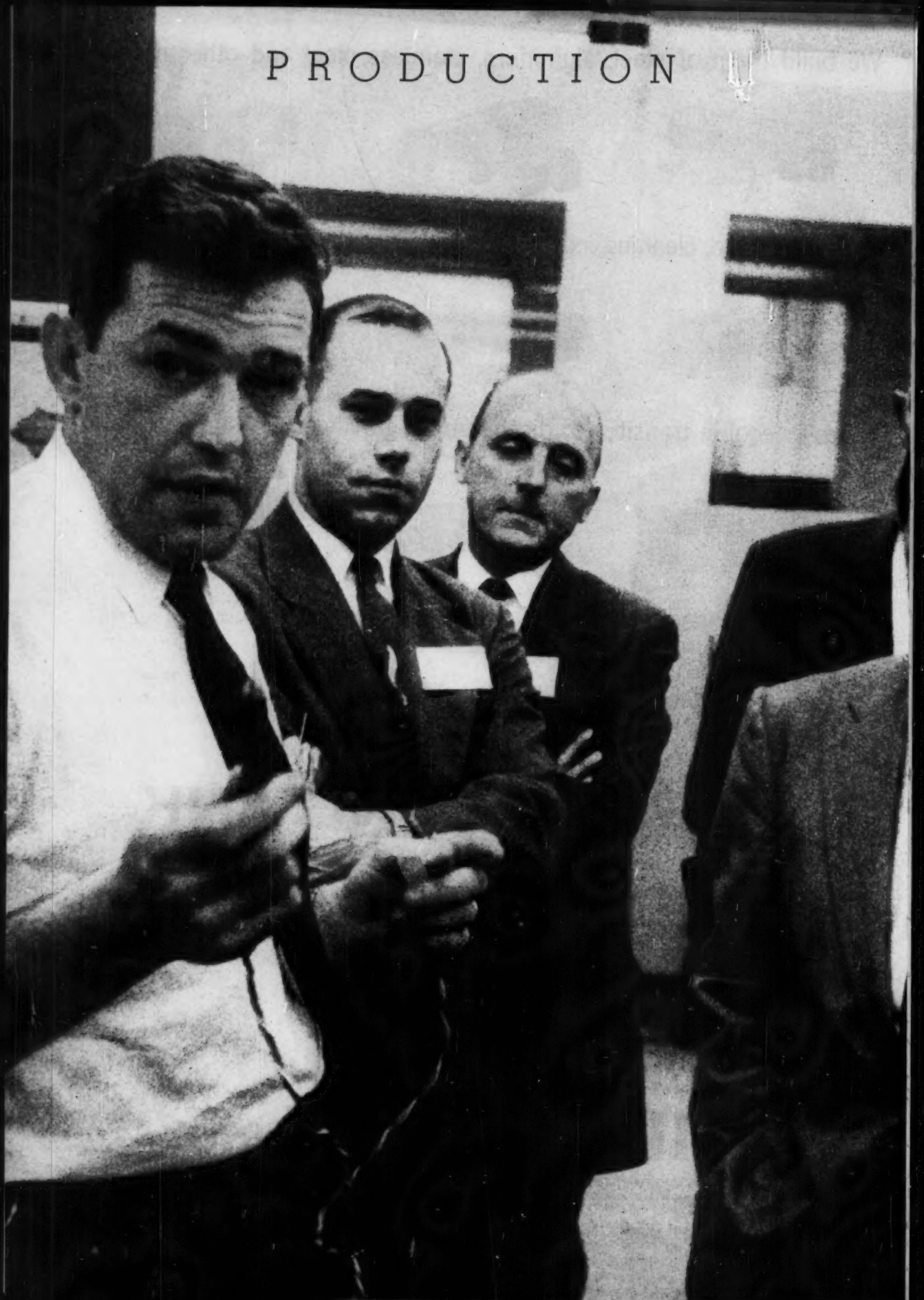

# Putting a Personal Touch in Communications

**The plant engineers** and chemists shown attending an engineering colloquium at American Cyanamid's Stamford (Conn.) research laboratories are back at their jobs this week armed with new information for solving plant operating problems.

The colloquium is one method used by companies, large and small, for disseminating technical information. But for Cyanamid, which has now held two at its Stamford labs, the colloquium is proving its special value in unlocking the door of basic engineering research for production.

Hugh M. Hulburt, manager of engineering research at Stamford's process development department, explains it this way: "Probably 80% of our work is the result of specific requests from operating divisions on items of commercial interest; or queries from research on new processes.

"And, when any of our research reaches the stage where we feel we have something to contribute, it is time to discuss it with people from the operating divisions."

The research in question must be in an area of broad interest to merit a conference of this type, of course. For example, the first colloquium was on mixing, was attended by 71; the second dealt with crystallization, drew 58. Hulburt feels that smaller groups would be worthwhile, too, foresees reduced attendance at individual sessions, as more subjects are covered.

**Two-Way Street:** Engineering research's contributions are only part of the colloquium, however. The divisional managers of manufacturing, in addition to receiving invitations to send engineers and chemists from the various plants and laboratories, have the opportunity to suggest topics.

And, while engineering researchers delve into fundamentals and theory, engineers and chemists from several plants present actual plant problems —aim is to stimulate new approaches to their solution.

At the two-day colloquium, plant engineers and chemists gained new basic knowledge. A tour of the labs

**Plant engineers, chemists tour labs, are briefed on projects.**

CW PHOTOS—ED WALLOWITCH

James Hamilton (left) of Bound Brook plant, Alwyn Buckland of Fortier plant compare notes during break.

Hamilton uses slides to illustrate findings in study of crystallization problem at Bound Brook plant.

Herbert Schoen of Stamford research laboratories explains setup for basic crystallization research.

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shows them other areas where basic engineering research may aid.

The value to plant technical people of a program that deals in basic research topics may be difficult to measure in terms of actual solutions of operating problems. But Hulburt has one positive indication: within a few months after the first colloquium he began receiving requests for another.

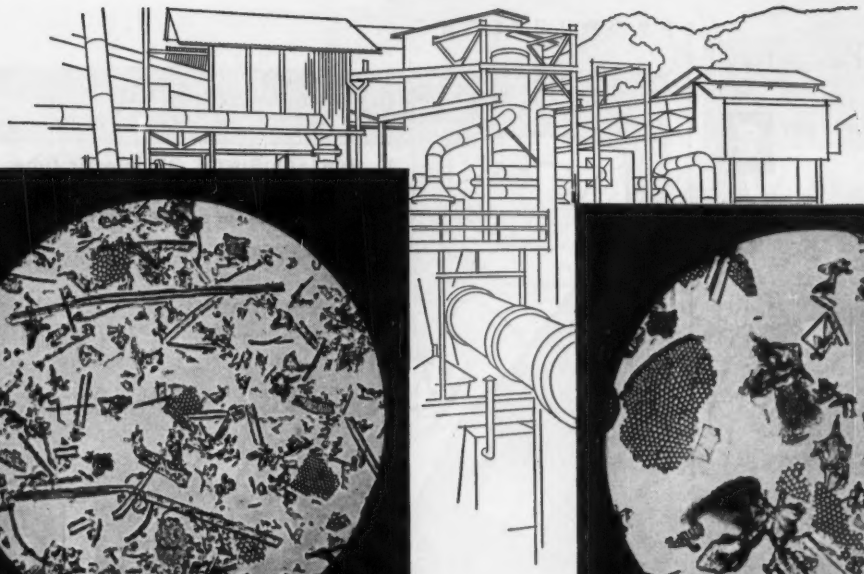
**Often a Matter of Size:** The personal touch is not always possible in the larger companies. Du Pont, for instance, issues a periodical on new

Hugh Hulburt, manager of engineering research, chats with plant men.

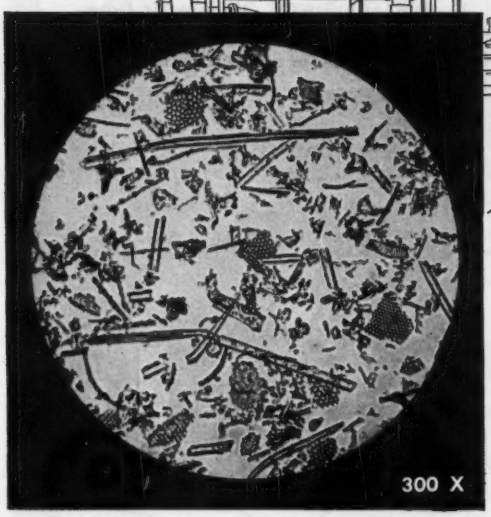
developments in research and engineering. Dow points up one of the problems of the larger companies: determining distribution of reports. Distribution can't be too narrow; on the other hand, there's the danger of information leaking outside.

Several small companies say that they have no technical communications problems with production. Often the top technical man is both plant manager and research director. And, opines one small firm's manufacturing vice-president: "While we can't employ large research and engineering staffs to delve into basic studies, we have to do our share of basic work—competition is too keen to ignore it. Our big advantage is that production is in on projects from the start."

For larger companies, however, there's no gainsaying an organized approach to keeping production people abreast of technological advances.



Milling and calcining equipment used for all Celite grades.

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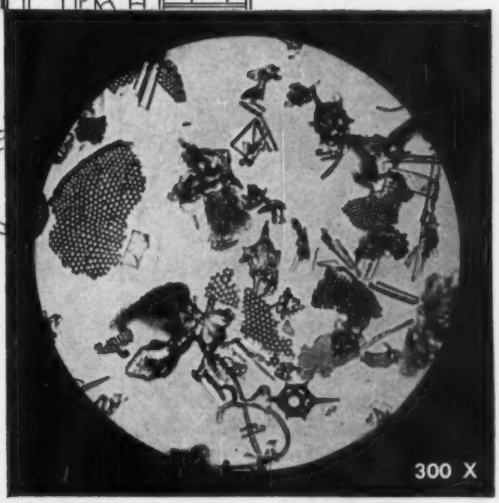


**For filtration of larger suspended particles**—Celite 545 combines maximum clarity plus faster flow rates.

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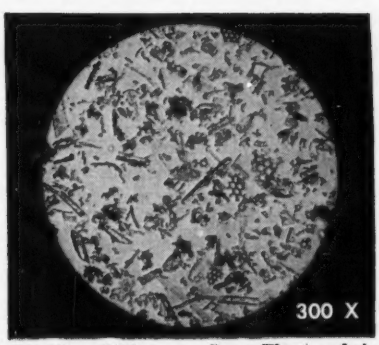
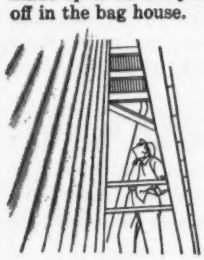



**For mineral filler use**—Super Floss grade is made up of carefully sized fines air-floated off in the bag house.



Typical J-M bag house equipment.

As the microscope shows, each grade of Celite* diatomite has its own distinctive particle size distribution. Yet no matter where or when purchased, each remains uniform from bag to bag—your assurance of top production results with minimum down-time.

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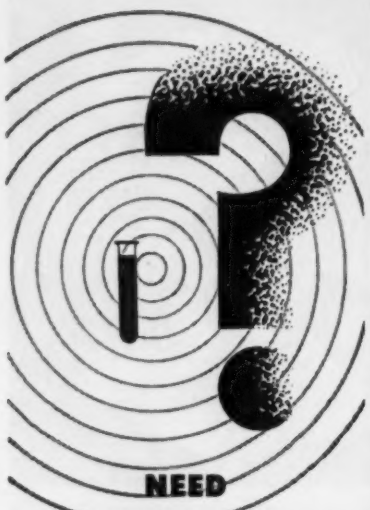

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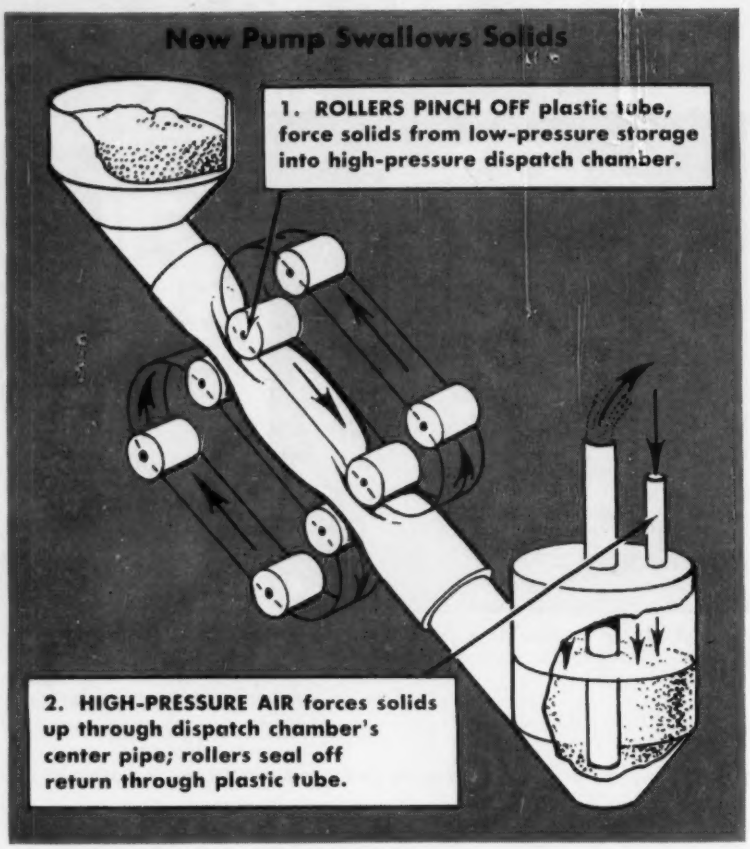
New Pump Swallows Solids
1. ROLLERS PINCH OFF plastic tube, force solids from low-pressure storage into high-pressure dispatch chamber.
2. HIGH-PRESSURE AIR forces solids up through dispatch chamber's center pipe; rollers seal off return through plastic tube.

# New Push for Dry Pumping

**The sketch above illustrates the operating principle of a new pump for conveying dry chemicals. Advantages: low cost, low line velocities, relatively small dust problems. Producer: Dens-Flo Pumps, Ltd., Seattle, Wash.**

The mode of action—progressively kneading material forward through a plastic tube—has proved successful in the pumping of viscous fluids, slurries and gases (*CW, Sept. 24, '55, p. 70*). Tagged the Dens-Flo Swallow Pump, the new unit is designed to handle such materials as dry clays, starch, cement, wood flour, food products and various industrial chemicals.

Compressed air is used to develop pressure in the dispatch chamber; the amount of air required is small (about 4.25 cfm. of 16-psi. air) and there is no need for separators or dust collectors at the discharge end.

The conveying lines operate full; very little air is entrained in the product. Result: line velocities are low and flexible. Polyethylene lines can be used.

The pump has limitations, however. At present, it is made in only one size, with capacity limited to 7½ tons/hour. Rated capacity is for material having a density of 32 lbs./cu. ft., would vary with density of material. And the distance material can be pumped is limited to 150 ft.

The unit costs $2,600. Critical component: neoprene-coated nylon pump tube, which has an estimated life of 6-12 months, costs about $50, takes about 30 minutes to replace. Little actual service-life data is available. Only one unit is in commercial operation, has been in service about a month pumping wood flour and melamine resin.

Dens-Flo looks for demand to develop among companies that must move dense, granular materials. The pump is distributed by Granu-Flow Systems, Ltd. (Seattle) and Motomco, Inc. (Clark, N.J.).

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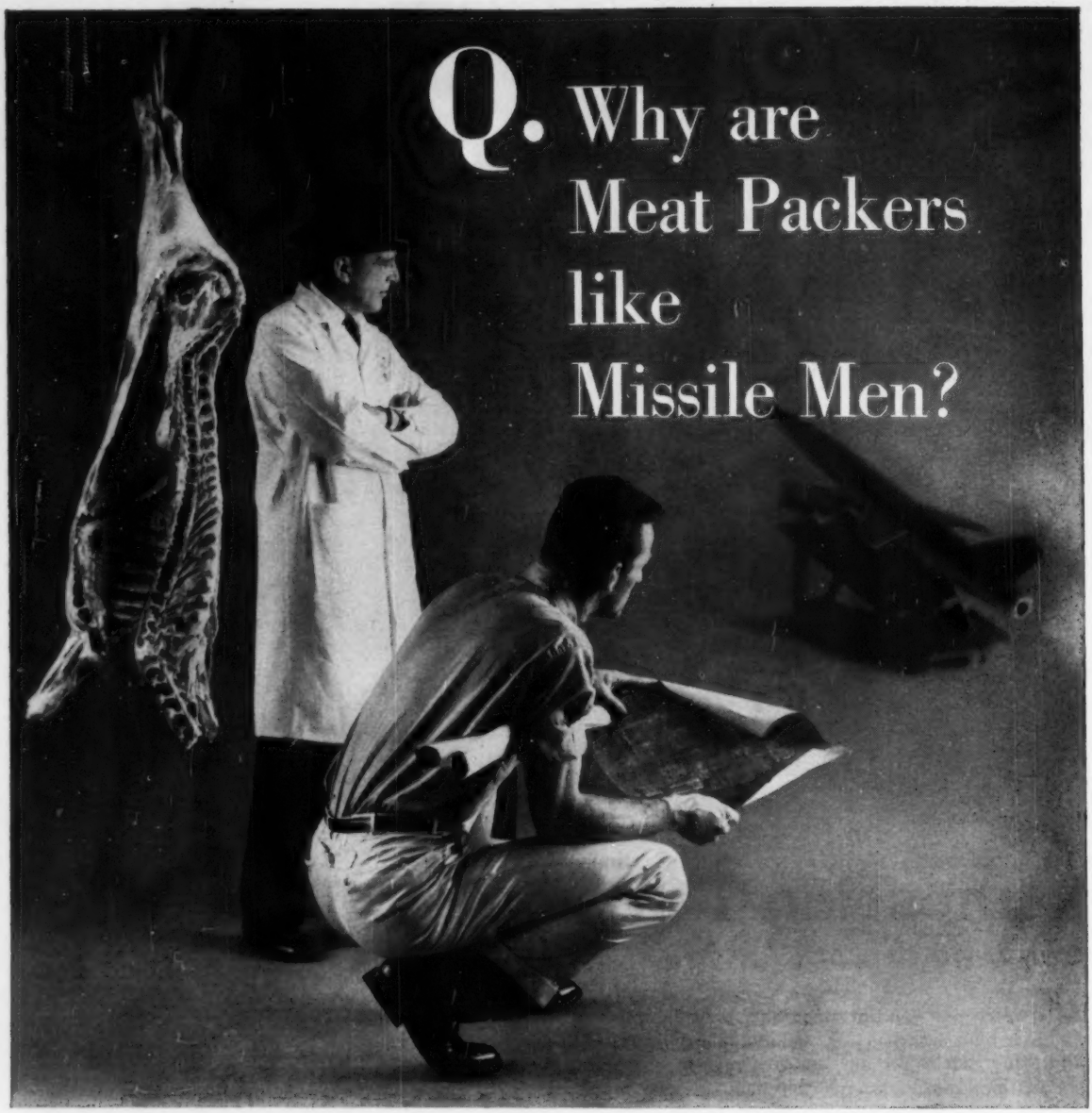


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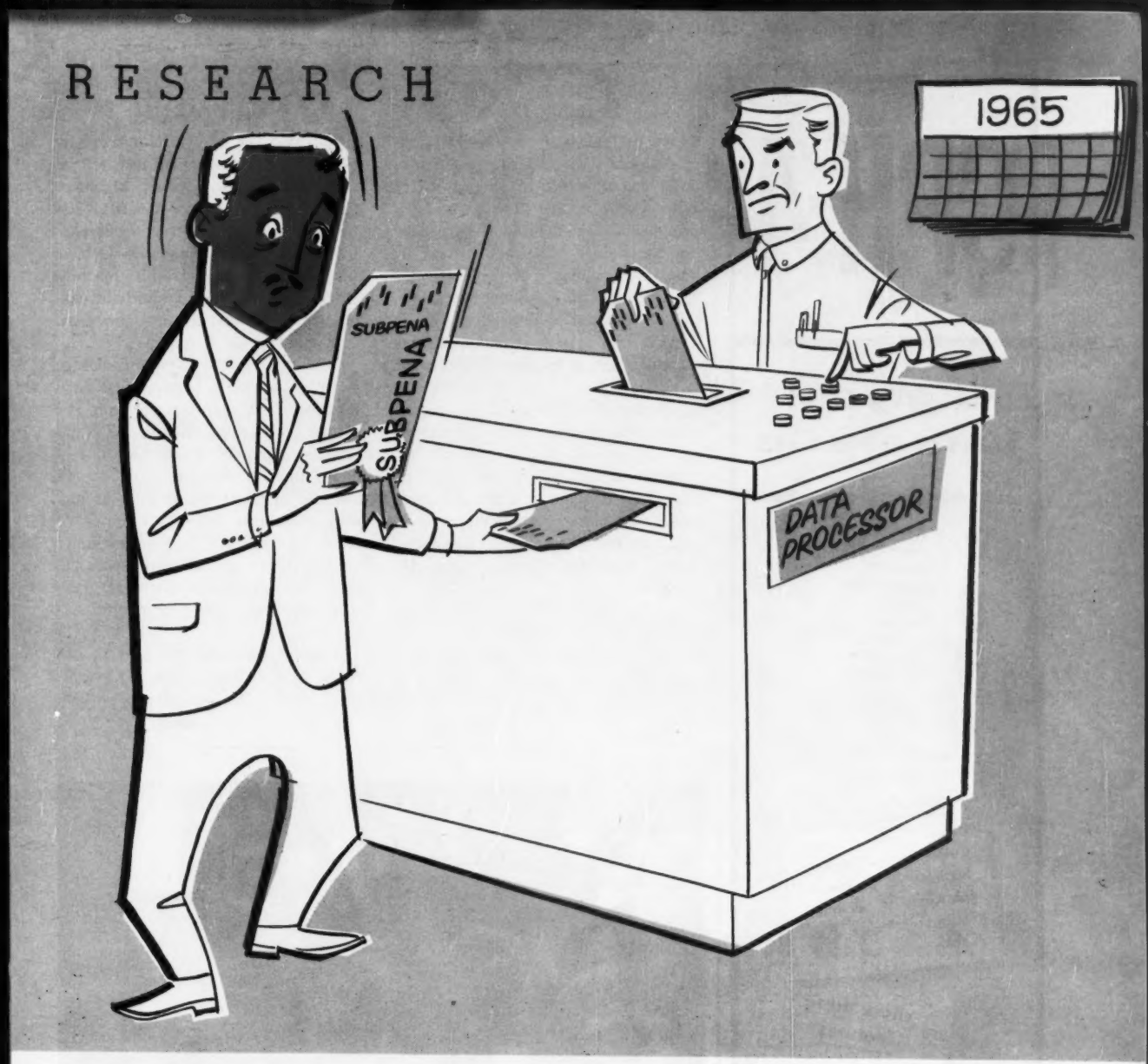


**Researchers may reap a summons instead of technical data unless copyright laws are clarified.**

# Legal Snag Looms for Automated Literature

**In the not-too-distant future, literature searching by machine could snag on the thorns of copyright law. That possibility—and what to do about preventing it—will come in for heated discussion at next month's meeting of the National Science Foundation's Scientific Information Council in Washington.**

The situation is this: scientific data "filed" in the machines for recovery as needed generally comes from published sources (some original data is also "filed"). Question is: Does researchers' use of this published material without permission of the publisher constitute copyright infringement?

Some say it does, and that's the question NSF wants to solve. The same question is under investigation by the Library of Congress (which may soon make recommendations to Congress for copyright law revisions). And it's also a big problem for firms with a stake in machine searching.

**Test Time:** Actual legal tests aren't likely to be carried on until machine searching becomes much more widely used. William Budington, associate librarian of the John Crerar Library (Chicago), explains: "An infringement takes place when a copyrighted article is reproduced in its entirety without permission (from author or publisher) whether on tape, punch cards or otherwise. And persons so involved are liable to prosecution. However, it is possible to write your own abstract and legally reproduce it by machine methods."

Two of the questions still unre-

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solved by law: Is the mechanical representation of new or abstracted material copyrightable in and of itself? What is the degree of liability of a firm that makes a business of reducing copyrighted material to cards or tape, then selling it to a user, who must necessarily reproduce the copyrighted material in printed form?

Anyone engaged in scientific research, where machines are expected to ultimately ease much of the burden of backtracking through published matter, has a stake in the answer to these questions. If the sources of scientific data stand on their property rights and demand that the data-machine users obtain permission and pay royalties for reproducing data, the flow of scientific information may be impeded.

On the other hand, an equitable arrangement for use of data is becoming increasingly urgent, while development of machine searching forges ahead.

For example, H. P. Luhn, manager of information retrieval research at International Business Machines Corp., recently adopted the IBM 704 for automatically abstracting scientific articles. Although too new to have yet found wide use, this machine could step up by many fold the volume of scientific data now processed mechanically.

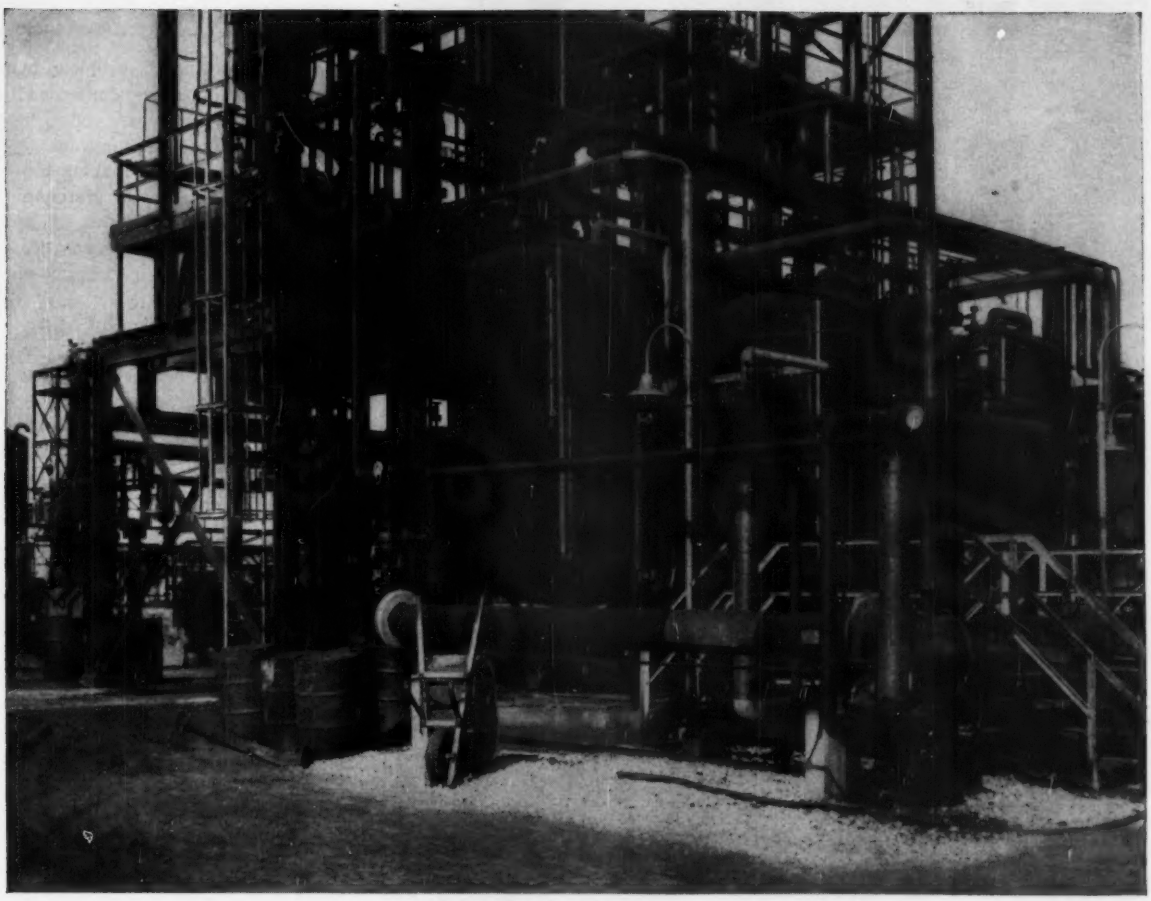
Ascher Opler of Computer Usage Corp. (New York) believes that newly abstracted information may be validly copyrighted. Remington Rand attorney Roland Booth notes that "even though the distributor doesn't use the material himself, or in any way attempt to put it into readable form, he probably is just as guilty as the user in infringing upon the copyright." Opinions such as these will help shape clear copyright rulings.

**Trade Tricks:** Herman Skolnik, director of Hercules Powder Co.'s technical information center, avoids what

## Hotter Test for Space-Age Metals

**This new apparatus** produces a plasma jet that electrically heats helium to 18,000-21,000 F for high-temperature metallurgical studies. Further development may boost heat to 30,000 F. The device was designed and built at Battelle Memorial Institute (Columbus, O.), operates up to 45 minutes at a stretch.

Properties of the plasma jet itself will also be investigated more fully by Battelle researchers.



These three reactor tanks at Celanese Corporation of America, Point Pleasant, W. Va., are of Nickel-clad steel. They stand up well to corrosive chlorides.

# Corrosive chlorides don't "put the bite" on these reactors

## ...*Reactors are made of Nickel-clad steel*

In making tricresyl phosphate for automotive and other uses, Celanese Corporation of America has its share of corrosion problems.

Although the final product is non-corrosive, the acidic raw materials and by-products could cause plenty of trouble for processing equipment if it were not adequately protected. The reactors, for example, are exposed to cresylic acid and phosphorus oxychloride. Storage tanks must handle hot crude tricresyl phosphate containing small amounts of hydrochloric acid.

In both places, Nickel-clad steel equipment is used not only to resist general corrosion, but also to prevent stress-corrosion cracking. Nickel and Monel* nickel-copper alloy are used at other points in Celanese's Point Pleasant, West Virginia plant where corrosion resistance is of prime importance.

Do you have a corrosion problem involving acid chlorides? Why not write for a copy of our Technical Bulletin T-29? It may suggest an answer.

*Registered trademark

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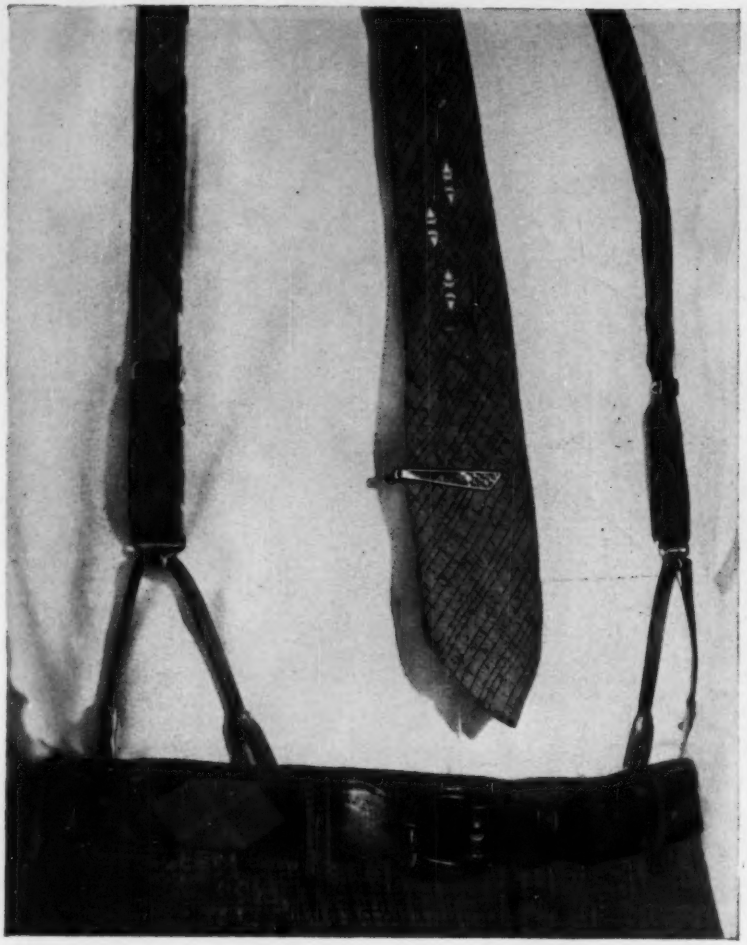
67 Wall Street New York 5, N.Y.

INCO TRADE MARK

**Inorganic Acid Chlorides in which satisfactory use of Monel or Nickel is recorded**

| Corrosive Media | Monel | Nickel |
|---|---|---|
| Aluminum Chloride ... | Yes | – |
| Ammonium Chloride .. | Yes | Yes |
| Antimony Chloride ... | Yes | – |
| Arsenic Trichloride ... | Yes | Yes |
| Magnesium Chloride .. | Yes | Yes |
| Manganous Chloride .. | Yes | – |
| Nitrosyl Chloride ..... | Yes | Yes |
| Phosphorus Oxychloride | – | Yes |
| Phosphorus Trichloride | – | Yes |
| Silicon Tetrachloride . | – | Yes |
| Sulfur Monochloride .. | Yes | Yes |
| Sulfuryl Chloride ..... | Yes | Yes |
| Tin Tetrachloride .... | Yes | – |
| Zinc Chloride ..... | Yes | Yes |

# INCO NICKEL ALLOYS



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**Wyandotte CHEMICALS**

MICHIGAN ALKALI DIVISION

PACING PROGRESS WITH CREATIVE CHEMISTRY

## RESEARCH

he considers a "sticky" problem by steering clear of any "duplicated" material that might pose copyright questions. Nor does he duplicate articles from journals (e.g., making copies of pertinent stories for Hercules' chemists), although some firms do, as a matter of economics. Technically, even one photocopy is a violation of a copyright.

Gerald Sophar, president of Microcard, Inc. (Washington, D.C.), reports his firm gets permission on the work it reproduces, but says the procedure can be troublesome. He would like to see something akin to the setup of the American Society of Composers and Publishers, by which companies in the reproducing business could get blanket approval to copy information. They could pay a fee to a central copyright center, which in turn could parcel it out to the source members. Sophar isn't seeking to avoid getting copyright permission, only hopes to make such permission easier to obtain.

Documentation Inc.'s (Washington, D.C.) Mortimer Taube tells *CW* his company "hasn't been hindered in its operations due to lack of a clear-cut ruling on copyrighting, but the problem hangs over all companies."

There haven't been many infringement complaints. One reason, he adds, is that reproduction doesn't often cut into the commercial value of the technical information—no one gets rich from the dissemination of a technical paper.

Now that the potential value of copyright clarification is emerging, both industry and government can be expected to give more attention to the problem of fixing the prerogatives and liabilities of machine searchers. For research managers, who gain most by speedier searches, this decision can't come too soon.

## PRODUCTS

**New Silicone:** XR-622 silicone impregnating resin, developed by Union Carbide's Silicones Division (Tonawanda, N.Y.), can be cured at 150 C vs. 200-250 C required for conventional silicone resins. It's offered as a timesaver in varnishing or coating electric coils, armatures, etc.

•

**Price Cuts:** Mann Research Laboratories, Inc. (New York), has re-

duced prices of its biochemicals, mevalonic acid, mevaldic acid and mevalactone; Callery Chemical Co. (Pittsburgh) has lowered prices (per pound in 100-lb. lots) of its pyridine-borane, now $14; dimethylamine-borane, $20; trimethylamine-borane, $22.

•

**Chelate Entry:** Harshaw Chemical Co. (Cleveland) now offers commercial quantities of aluminum chelate PEA-1, a chemically modified aluminum isopropylate suggested for use in curing epoxy and phenolic resins, and imparting water repellency to textiles.

•

**New Plastic:** Farbenfabriken Bayer AG. has started production of a new polycarbonate called Macrolon for use in the —150+243 F range. Bayer expects that the plastic will find new uses in the auto and electrical fields.

## EXPANSION

• Atlantic Research Corp. (Alexandria, Va.) has begun moving into a completed wing of its new, $1-million headquarters.

• International Equipment Co. (Boston) is expanding its plant area 25% as part of its program of accelerated research and development in centrifuges for research use.

## REPORTS

**The following reports** are available from the Office of Technical Services, U.S. Dept. of Commerce, Washington:

• "Investigation of Various Metal Protective Coatings on the Gum Formation and Oxidation Stability of Gasoline" (PB 131738, $1) reports the details of that study. It says that coatings containing butadiene-acrylonitrile copolymer and phenolic resin are satisfactory protection for steel (containers) against the effects of gasoline and moisture. Several commercial coatings tested did not give the desired protection.

• "A Basic Study on Development of Diesters with Improved Thermal and Hydrolytic Stability" (PB 151265, $2). The study was prompted by a need to improve the thermal and hydrolytic stability of present dibasic acid diesters as synthetic lubricants. Thermal stability was shown greatly dependent upon structural configuration of the alkyl portion of the diester molecule.

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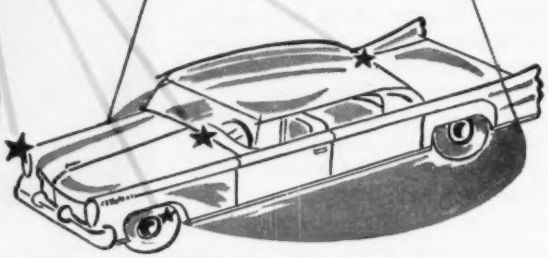
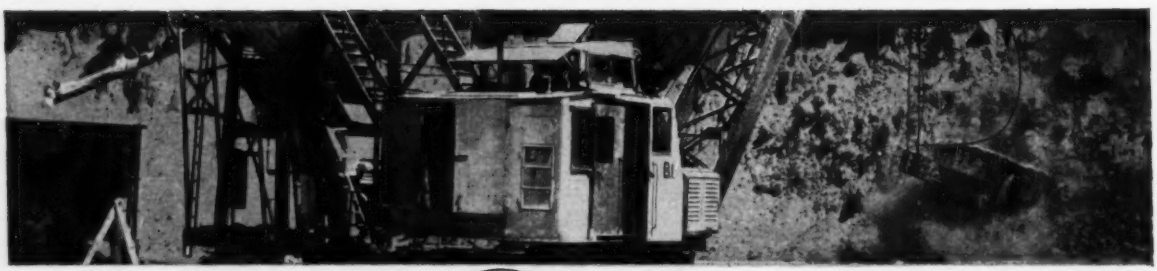


Sulphur enters the automobile picture in two ways: directly and indirectly.

Sulphur, either as the elemental or as one or more derivatives, is used in the manufacture of rubber and rayon. Indirectly, it is used in processing the steel that forms the body. It is used in the plating operation on trim and fixtures. It is deliberately introduced into certain steels to provide better machining qualities.

Recognizing the importance of Sulphur to the basic industries such as the manufacture of automobiles, and to our ever-expanding economy generally, TGS is broadening its service: production, distribution and technical.



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# Market Newsletter

CHEMICAL WEEK
March 7, 1959

**Best Fertilizer's new ammonia plant at Lathrop, Calif.,** is now fully onstream—running almost 10% above design capacity. Blueprinted to make 117 tons/day, it's turning out 125-130 tons/day.

This semicooperative organization can now push hard for a share of the highly competitive Western ammonia market. It has already picked some advance billing—by offering ammonia at $63/ton for '59 off-season delivery and $68/ton for season delivery in '60 (*CW, Jan. 31, p. 82; Market Newsletter, Nov. 1, '58*).

Shell—largest ammonia producer in the West—promptly cut its ammonia price to $66/ton.

Now, as the busy '59 fertilizer season gets into full swing, it leaves Western ammonia marketers still juggling two hot problems—overcapacity and low prices; and there's little likelihood that they will soon find a way out of the predicament.

•

**A long-awaited boost of methanol prices came last week.** Commercial Solvents posted 4¢/gal. higher tags, effective April 1. The across-the-board increase had been expected by Jan. 1 (*CW Market Newsletter, Nov. 29, '58*). The boost was in the expected range of 4-6¢/gal. CS's reason for the hike: "increases in production costs and freight rates."

Typical new quotes (delivered): 30¢/gal. in tank cars and tank trucks (4,000-gal. minimum); 51.5¢ in drums, carloads. West Coast prices are 4¢/gal. higher.

Other methanol producers were obviously caught off-guard by the unexpectedly early announcement, hastily reviewed their own positions. Over the week-end, several other major producers (Du Pont, Celanese, Allied's Nitrogen Division) decided to follow CS's move and swiftly set an industry-wide pattern.

•

**A recent cut of lead prices has shaved tetraethyl lead tabs,** in line with the industry's historic pricing pattern. Within hours, Du Pont and Ethyl last week shaved costs of comparable TEL products.

Du Pont's reductions: Motor Mix, down from 60.75¢/lb. to 60.24¢; Motor Mix A, reduced from 61.75¢/lb. to 61.24¢; Aviation Mix, previously 66.65¢/lb. now 66.14¢/lb.

•

**Manufacture and sale of methylstyrene molding compounds** is being discontinued by American Cyanamid. Official reason: the firm's wishes to "concentrate its efforts in fields of greater economic promise." It's known that methylstyrene has had rough going in a fiercely competitive market by declining prices, imported materials. Cyanamid product is tradenamed Cymac.

Dow Chemical markets two products that have competed directly with Cymac in applications requiring resins with high heat-distortion points. Neither Dow product is a methylstyrene: Dow's Styron-700, for example, is a polystyrene material, has competed with Cymac 400; Dow's Tyril, a styrene-acrylonitrile copolymer, compares with Cymac 201.

•

**Extruded, plasticized polyvinyl chloride film,** in commercial quantities—approved for food packaging by the Food & Drug Administration—is now available from Goodyear Tire & Rubber.

Called Vitafilm F, the new 1-mil (21,500 sq. in./lb.) product is priced at 73¢/lb. It reportedly can be used in straight or overwrap applications, readily laminates to paper, film or foil to produce special pouch-type packages.

•

**Major expansion of activated carbon facilities** by Pittsburgh Coke & Chemical now seems likely. The firm—largest U.S. producer of granular activated carbons for purification purposes—is completing plans for an addition to existing facilities, will probably complete the job later this year. So far, there is no official word on the expansion.

•

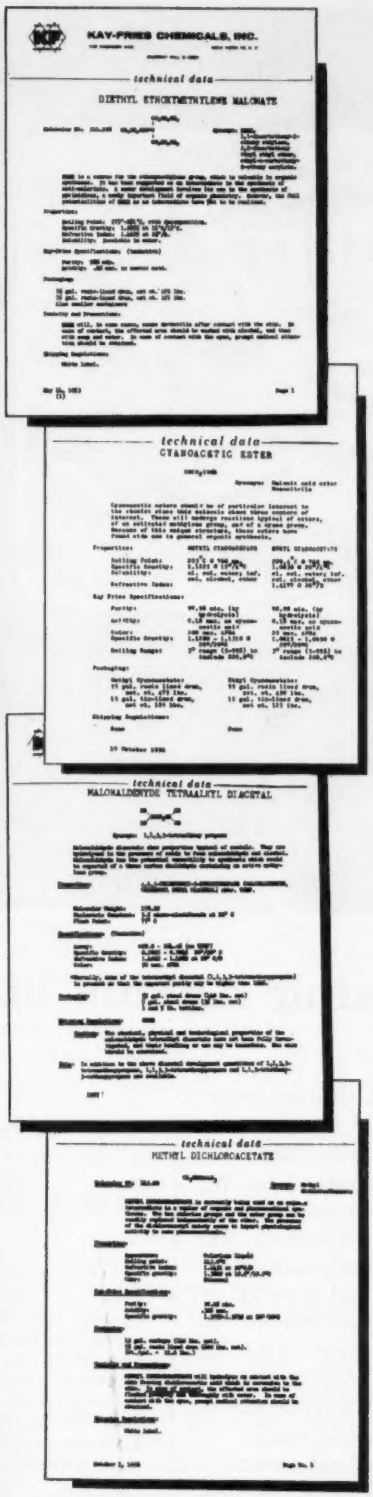
**Alterations in some well-established shipping methods of the CPI** have been becoming increasingly likely in the past few weeks. Reason: a trend toward establishment of international shipping regulations. Victor Hanniger of the Interstate Commerce Commission's Bureau of Safety and Service told of the changing situation at a recent New York meeting of the Compressed Gas Assn. This warning applies not only to compressed gas manufacturers but also to all chemical producers.

Demands for a set of international controls, Hanniger explained, are arising as foreign nations go into quantity production of a greater variety of products. The move toward international regulations is more pronounced in Europe than it is here, he said, and U.S. regulations won't necessarily receive top recognition solely because they are older or more complete than those in other countries.

**SELECTED PRICE CHANGES — WEEK ENDING MARCH 2, 1959**

| | Change | New Price |
|---|---|---|
| **UP** | | |
| Coconut oil, crude, tanks, Pac. Coast | $ 0.005 | $ 0.1975 |
| Palm oil, clarif., dms. | 0.005 | 0.14 |
| Tin metal (Straits) | 0.0125 | 1.04875 |
| **DOWN** | | |
| Lead metal, prime, pigs, New York | $ 0.005 | $ 0.11 |
| Lead, red, 95% bbls., c.l. | 0.005 | 0.1325 |
| Litharge, coml., powd., bbls., c.l. | 0.005 | 0.1275 |
| Mineral orange, American, bbls., c.l. | 0.005 | 0.1560 |

**All prices per pound unless quantity is quoted.**

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"What I mean," said the P.A., "You handle my phosphate orders and phone calls as if you were a one man outfit. The fellow I call to make up or change an order usually gives me the shipping information, routing and all those details while I hold the phone . . . like I was his only customer and he had been sitting around waiting for my call. How can you do that with an operation so large? . . . Do you do it for *every* buyer that calls in an order?"

The answer to that one is YES. We try to make ourself as useful as we can to the Purchasing Agent . . . because he is the man that's responsible for every new plant that goes up on our thousand acre site. We try to make his buying job easier by cutting out the red tape that elsewhere snarls him up in chasing down orders and in paper work and "bookkeeping."

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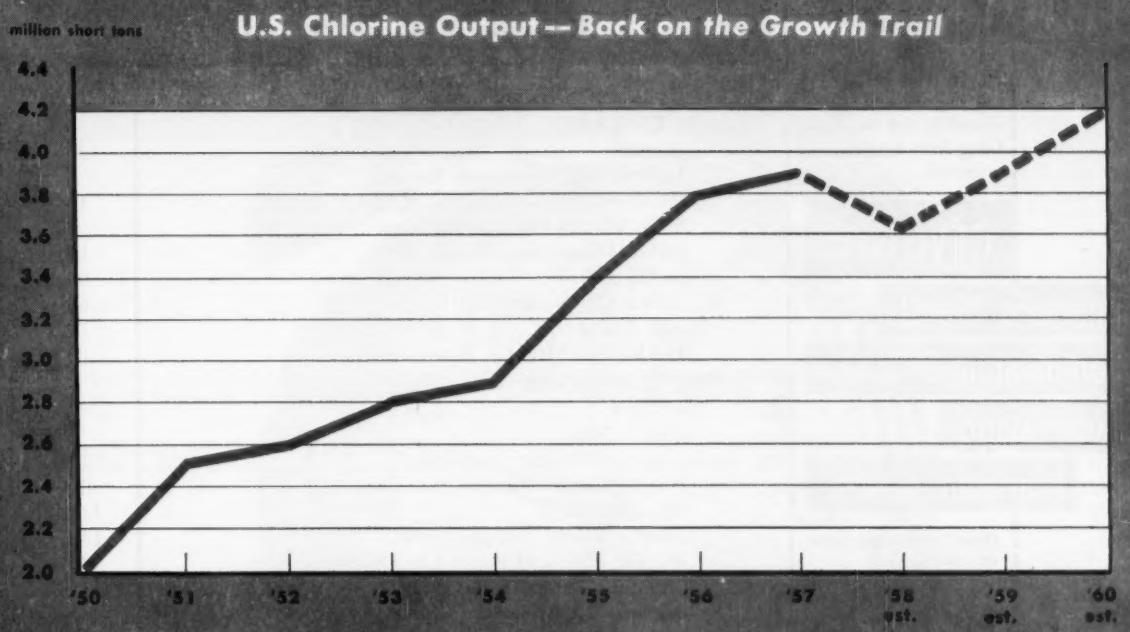
*Joliet, Illinois / Division of Olin Mathieson Chemical Corporation*




# Confidence Keys Chlorine Makers' Outlook

**U.S. chlorine capacity will pass the 5-million-tons/year mark by the beginning of '60 as the result of 240,000 tons of new capacity that will be on-stream this year. Meanwhile, several producers are quietly laying plans for new chlorine expansions, and betting that a continuing economic upturn will justify action.**

Largest installation due onstream this year is Wyandotte Chemicals' spanking-new plant at Geismar, La., with a rated capacity of 300 tons/day. The first cell room, with 156 diaphragm cells (150-tons/day capacity), is undergoing shakedown operations now, will start up this month. A second, similar installation is scheduled for operation by the end of '59.

Wyandotte has an existing ethylene oxide-ethylene glycol plant at the same site, but this unit employs direct oxidation of ethylene, rather than making use of the chlorine-consuming chlorohydrin process. Therefore, the company will seek other outlets for its chlorine production. Prime sales target will be pulp and paper manufacturers and other chemical producers.

To help lure "over the fence" customers into the plant vicinity, Wyandotte is making available extra docking and power facilities, real estate.

Jefferson Chemical's first chlorine plant at Port Neches, Tex., started up in the first week of January. Its rated capacity: about 150 tons/day. Production will be used captively at the company's nearby ethylene oxide-ethylene glycol plant. Meanwhile, construction has been started on another unit that will produce propylene oxide and propylene glycol—which will require use of a large portion of the chlorine output.

Another 175 tons/day of chlorine capacity will be added to the Diamond Alkali facilities at Houston, Tex., boosting total plant capacity to 715 tons/day. Probable completion date will be in September or October.

Diamond recently revealed that it will also modernize its facilities at Painesville, O., by replacing existing cells with the company's new rectangular cells. Capacity will remain about the same, but savings will be realized on space requirements because only 144 cells will be needed, compared with 2,432 now operating.

Stauffer Chemical plans to expand and modernize its plant at Niagara Falls, N. Y. *(CW, Feb. 21, p. 34)*. The $2-million program, scheduled for completion in the fall of this year, will up present capacity by 25% to 160 tons/day. The entire chlorine output of this plant is used captively as a raw material in the production of other company products.

**Capacity vs. Demand:** U.S. chlorine production in '60—expected to reach 4.2 million tons—will represent about 84% of total capacity. In the past, chlorine producers have usually started new expansion plans when actual output reached 85-90% of total capacity. Therefore, any sharp acceleration of chlorine demand could spur greater activity by chlorine makers, who generally follow a policy of expanding production well ahead of their actual needs.

While some observers predict few additional new expansion programs in the near future, others believe that a definite brightening of the economic picture later in '59 could signal another spree of new capacity plans.

A 7% decline in chlorine demand last year—200,000 tons—was partly

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## U.S. Chlorine Capacity by Jan. 1, '59 (est.)—tons/day

| | |
|---|---|
| **NEW ENGLAND** | |
| *Maine* | *36* |
| Eastern Mfg. Co. (South Brewer) | 6 |
| Penobscot Chem. Fibre Co. (Great Works) | 12 |
| S. D. Warren Co. (Cumberland) | 5 |
| Oxford Paper Co. (Rumford) | 13 |
| *New Hampshire* | *60* |
| Brown Co. (Berlin) | 60 |
| *Rhode Island* | *10* |
| Fields Point Mfg. Co. (Providence) | 10 |
| **MIDDLE ATLANTIC** | |
| *New York* | *1,094* |
| Allied Chem. | |
| Solvay Division (Syracuse) | 220 |
| Hooker Chem. (Niagara Falls) | 305 |
| Olin Mathieson | 115 |
| Stauffer Chem. (Niagara Falls) | 130 |
| W. Va. Pulp and Paper Co. (Mechanicsville) | 20 |
| Du Pont (Niagara Falls) | 181 |
| International Minerals (Niagara Falls) | 23 |
| *New Jersey* | *76* |
| General Aniline & Film (Linden) | 50 |
| Du Pont (Deepwater) | 26 |
| *Pennsylvania* | *14* |
| N.Y. & Penna. Co. (Johnsonburg) | 14 |
| **EAST NORTH CENTRAL** | |
| *Ohio* | *480* |
| Diamond Alkali (Painesville) | 155 |
| Columbia-Southern (Barberton) | 225 |
| National Distillers (Ashtabula) | 100 |
| *Michigan* | *1,705* |
| Dow Chem. (Midland) | 785 |
| Hooker Chem. (Montague) | 180 |
| Penn. Salt (Wyandotte) | 190 |
| Wyandotte Chem. (Wyandotte) | 550 |
| *Wisconsin* | *10* |
| Kimberly-Clark (Kimberly) | 10 |
| **WEST NORTH CENTRAL** | |
| *Missouri* | *158* |
| Monsanto Chem. (East St. Louis) | 158 |
| *Kansas* | *225* |
| Frontier (Wichita) | 225 |
| **EAST SOUTH CENTRAL** | |
| *Kentucky* | *150* |
| Penn Salt (Calvert City) | 150 |
| *Tennessee* | *119* |
| Du Pont (Memphis) | 50 |
| Velsicol (Memphis) | 69 |
| *Alabama* | *635* |
| Diamond Alkali (Muscle Shoals) | 260 |
| Monsanto Chem. (Anniston) | 25 |
| Olin Mathieson (McIntosh) | 250 |
| National Distillers (Huntsville) | 100 |
| **SOUTH ATLANTIC** | |
| *Maryland* | *101* |
| W. Va. Pulp and Paper (Luke) | 16 |



*Table continued on p. 117*

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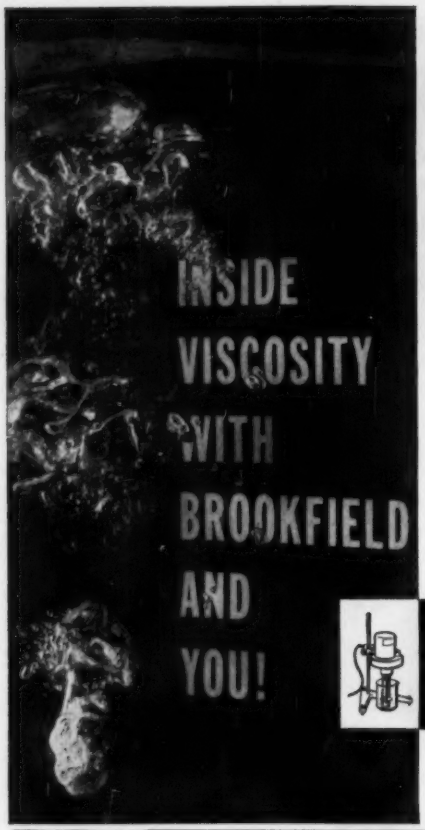


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attributed to the general business slowdown. Another demand-depressing factor was the increased importation of perchlorethylene and trichloroethylene.

Most of the decline in chlorine production came during the first half of '58—low point of business activity, Later in the year, production picked up sharply and appears to be remaining firm.

Although the outlook is now quite optimistic, the real test of chlorine's market strength will come in the spring—traditionally the industry's busiest season. Demand for chlorine-consuming products such as ethylene glycol, chlorinated pesticides, and water- and sewage-treatment chemicals is usually higher during this period.

**End-Use Pattern:** The major part of U.S. chlorine output is consumed captively, but firms sell a considerable amount to others. Biggest general area of chlorine consumption is in manufacture of chemicals. Perhaps the largest individual user of merchant chlorine—despite installation in the past few years of much captive chlorine capacity—is the pulp and paper industry.

One industry estimate of chlorine end-uses indicates that roughly 83% of all chlorine goes into chemicals, 13% into pulp/paper needs, about 3% for sanitation, probably not more than 1% for miscellaneous uses.

**Long-Range Outlook:** Despite the over-all slump of chlorine demand in '58, the long-range outlook is, of course, for considerably increased requirements by the many consuming industries. Pulp and paper requirements for the chlorination of pulp will continue to expand, even though use in the bleaching operation may decline, due to competition from other chemicals, particularly chlorine dioxide.

Other obvious growth areas include aerosol propellents, drycleaning solvents, industrial degreasing solvents, and polymers such as polyvinyl chloride.

It's clear that steady increases in chlorine requirements over the long range will necessitate eventual installation of more production facilities; and a spate of new expansions will surely follow the first really convincing signs of another economic boom, which, some think, may start later this year.

## U.S. Chlorine Capacity by Jan. 1, '59 (est.)—tons/day

| | |
|---|---|
| Diamond Alkali (Edgewood) | 85 |
| *Virginia* | *465* |
| Hercules Powder (Hopewell) | 50 |
| Allied Chem. (Hopewell) | 180 |
| Olin Mathieson (Saltville) | 225 |
| W. Va. Pulp and Paper (Covington) | 10 |
| *West Virginia* | *1,260* |
| Allied Chem., Solvay Division (Moundsville) | 200 |
| Columbia-Southern (Natrium) | 600 |
| Westvaco, division of FMC (South Charleston) | 460 |
| *North Carolina* | *68* |
| Champion Paper & Fibre (Canton) | 50 |
| Ecusta Paper Co. (Pisgah) | 6 |
| N. Carolina Pulp and Paper (Plymouth) | 12 |
| *Georgia* | *227* |
| Allied Chem. (Brunswick) | 200 |
| Hercules Powder (Brunswick) | 27 |
| **WEST SOUTH CENTRAL** | |
| *Arkansas* | *75* |
| Arkansas Louisiana Chem. (Pine Bluff) | 75 |
| *Louisiana* | *1,432* |
| Allied Chem., Solvay Division (Baton Rouge) | 60 |
| Columbia-Southern (Lake Charles) | 700 |
| Dow Chem. (Plaquemine) | 300 |
| Kaiser Aluminum (Gramercy) | 100 |
| Ethyl Corp (Baton Rouge) | 272 |
| *Texas* | *3,702* |
| Columbia-Southern (Corpus Christi) | 225 |
| Frontier (Seagraves) | 25 |
| Gulf Oil (Port Arthur) | 17 |
| Diamond Alkali (Houston) | 540 |
| Dow Chemical (Freeport) | 2750 |
| Ethyl Corp. (Houston) | 105 |
| Champion Paper & Fibre (Pasadena) | 40 |
| **MOUNTAIN** | |
| *Nevada* | *200* |
| Stauffer Chem. (Henderson) | 200 |
| **PACIFIC** | |
| *Washington* | *610* |
| Weyerhaeuser Timber (Longview) | 155 |
| Hooker Chem. (Tacoma) | 335 |
| Penn. Salt (Tacoma) | 130 |
| *Oregon* | *135* |
| Penn. Salt (Portland) | 135 |
| *California* | *250* |
| Dow Chem. (Pittsburg) | 250 |
| **NEW PLANTS** | |
| Wyandotte Chemical (Geismar, La.) | |
| First unit due mid-March '59 | 150 |
| Second unit due end of '59 | 150 |
| Jefferson Chemical (Port Neches, Tex.) | 150 |
| **EXPANSIONS** | |
| Diamond Alkali (Houston, Tex.) | 175 |
| Stauffer Chemical (Niagara Falls, N.Y.) | 30 |
| Total capacity from new plants and expansions | 655 |


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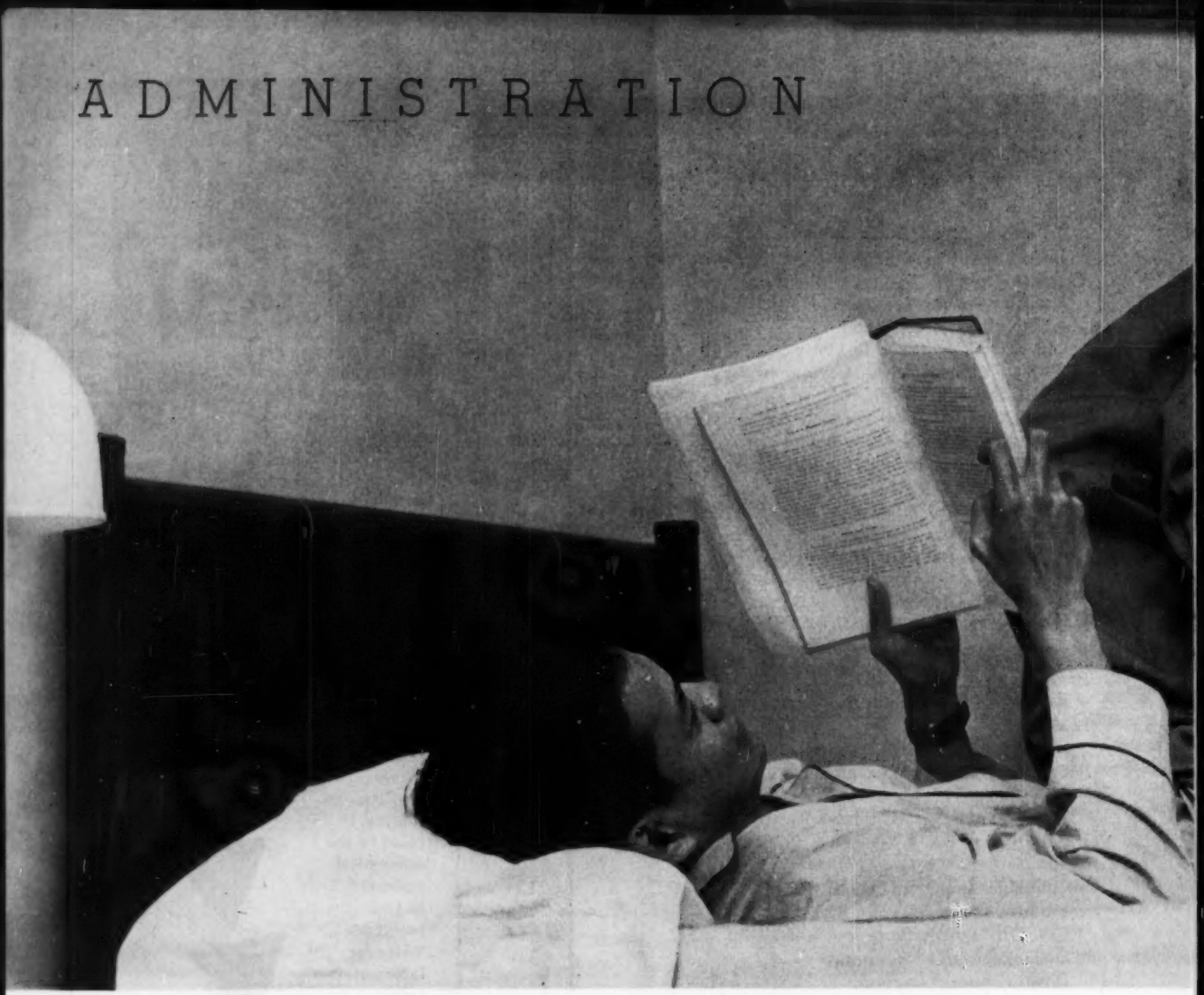


HOMEWORK is essential ingredient of practice school for Bienvenido Eusebio, boning up on theory

# Chemical Plant Campus Teaches Students

ATTACK ON PROBLEM starts with definition by team and group leader. This student group at Cyanamid hopes to improve nitric acid yields.

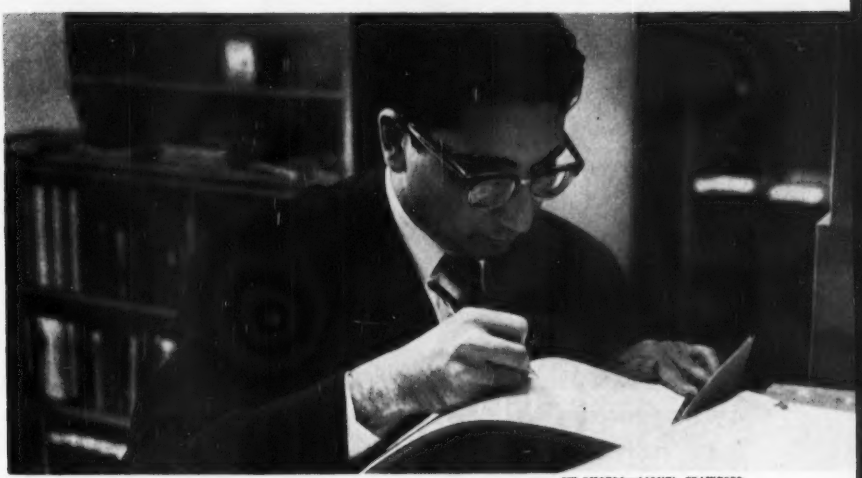
**Engineering students and CPI plants can meet on common ground —with a high yield for both. This week, at plants of American Cyanamid and Esso Standard Oil, 20 high-ranking students from the Massachusetts Institute of Technology are turning from their books to solve "live" plant problems in actual operations.**

They're there because Cyanamid (at Bound Brook, N. J.) and Esso (at its Linden, N. J., refinery) have become integral parts of the MIT School of Chemical Engineering Practice, set up to give graduate and undergraduate students projects that require initiative in applying their basic scientific and engineering training.

Professor Walter Whitman, head of the Dept. of Chemical Engineering at

W. S. FRUTCHEY
in his Plainfield, N.J., quarters.

GETTING INFORMATION from plant people is important early step. Here, economic data is provided by plant purchasing agent.



CW PHOTOS—LIONEL CRAWFORD
LITERATURE SEARCH provides background, helps preclude unproductive efforts. Cyanamid technical library is scene of this student's exploration.

IN OPERATING AREA, students put classroom theory to practice. Students prepare to take gas samples in furnace efficiency test at Esso.

# Industry Slant

MIT, and chief of the practice school, holds that fundamentally the program "develops students' abilities to communicate ideas and integrate human-relations problems with their engineering efforts."

To set the course apart from the usual in-plant-training, or industry-cooperation program, the practice school puts a full-time MIT engineering faculty member at each plant where it operates. It's the job of the teacher to see that problems are developed jointly by himself and company people. Together they follow three main criteria:

- The problems must be educational and require originality or creativeness on the part of the students.
- The scope of the problems must

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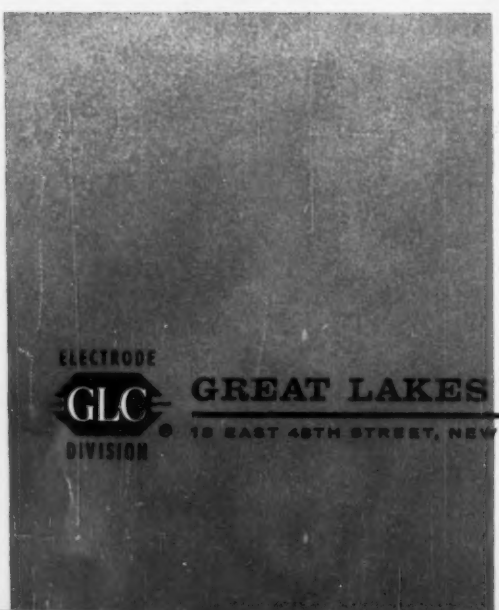

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be such that the students can achieve results in the time allotted.

• The knowledge gained or the solution of the problem must be of value to the plant.

**A Semester Away:** Each group of students in the school is off the MIT campus for a full semester. At the Bound Brook and Esso locations the program calls for the two groups of 10 men each to work nine weeks at each location, changing places with one another at midterm. Board and lodging are provided for all single men at a rented house in Plainfield, N. J. Married students and their families are quartered in special apartments. Students pay their way just as at college.

**Teamwork on Problems:** In plant, the students are provided with a working area, usually comprised of conference space, laboratory facilities, study room, offices and library. Hours of attendance are left largely up to the students—the majority, of course, have found it most convenient to be on deck when plant personnel are at work.

Problems are set up to run two to three weeks. Usually they are devised or defined by plant personnel through a committee that meets with school representatives. Students work in teams of two or three each. Once a week, a conference session is held, at which all students go over the previous week's material and findings, and exchange ideas.

Each team has a group leader—replaced from time to time to allow each student a chance at managing the team. At the Cyanamid location, special leadership training classes are held.

**Results Benefit Plant:** When problems are solved, or sufficient information has been gained, the students prepare reports. In order to insure a quick means of getting their findings into the mainstream of plant communications, the groups give preliminary oral reports to the parties concerned, later prepare written reports complete with data.

How well these practice schools help both plant and student is summed up by Esso plant manager Ross Murrell: "Frequently they yield important technical contributions. The companies' use of these results greatly stimulates the confidence of the students in their engineering ability."

CONTROL PANEL serves as classroom area, gives students chance to work with operating personnel in making experiments.

**Pilot plant offers this group lesson in practical process engineering.**

TABULATING DATA with aid of computer is a key step in finishing the Esso problem.

GROUP CONFERENCE discusses result of the project before going on to new problems.

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## ADMINISTRATION

### LABOR

**Dixie Unions:** In Georgia, another step toward tightening labor law has been taken. The Georgia state legislature has passed a law making unions "legally responsible" so that they may sue or be sued. It is regarded as the most significant piece of labor legislation there since passage of the Georgia right-to-work law.

The bill exempts personal property of a union member from court assignment "unless such member has personally participated in the transaction for which action was instituted."

•

**Short Week:** One of the biggest items coming out of AFL-CIO strategy meetings in Puerto Rico is the demand for a 35-hour work week. The federation will make a three-pronged unified approach to securing it by simultaneously launching promotion campaigns from federation headquarters, legislative lobbying in Washington, and bargaining demands in labor negotiations.

Impact on chemical process contracts is expected to be slight for some time. Oil contracts, for example, are sewed up for '59; in continuous chemical processing, the natural subdivision of 24 hours would fall in four shifts of six hours each, resulting in a 30-hour week, not 35. Still another obstacle is pointed up by OCAW President O. A. Knight who told *CW* "The problem is to [convince] the union member. When he worked the 10-12-hour day, it was easier. But the eight-hour day isn't any physical hardship. We've got to show him that his job is threatened."

### LEGAL

**Pollution Law Proposed:** California's Gov. Edmund Brown has submitted a "pioneering," state air-pollution-control program that could result in a "get-tough" law similar to Chicago's new air-pollution-control ordinance (*CW, Feb. 14, p. 80*).

Brown's program, under consideration by the state legislature, calls for standards regulating discharge of pollutants from motor vehicles, more funds for contract research in air pollution, minimum quality standards for air (similar in nature to drinking-water standards), an air-pollution field unit in Los Angeles and a regional

# Why Business Prefers Ohio

**OHIO RATES** second only to California in the affections of a number of the nation's key industrialists. However, the music from this second fiddle is melodious to the ears of Ohioans. It emanates from the industrial world—the hum of assembly lines, the whir of propellors of newly produced planes, the thumping of pneumatic stamping machines and many other notes familiar in areas of economic progress.

At the moment Ohio is second in the thoughts of industrial leaders when they are queried on their preferences of states in which to locate new plants. And it is a close second.

In a poll taken among 283 industrial officials, 61 favored Ohio as the area their companies would consider in picking a new plant site. Only California, with 77 votes, outdid the Buckeye State.

**THE POLL** which gave Ohio its 61 first choice votes was taken by Business Week magazine. Executives were asked to state the major factors or reasons that enter into the decision of considering a new plant location.

By far the most important reason uncovered by the survey was nearness to market, sales area or customers. Other leading considerations were available labor supply, reasonable taxes, availability of raw materials, transportation or shipping facilities, weather or climate and labor costs.

Ohio has much to offer in these categories. Its good inventory in these necessities to industry has enabled it to advance tremendously in recent years. At present Ohio is second only to New York as the nation's No. 1 industrial state.

**NO ONE CAN QUESTION** the excellent geographical location of Ohio. Its transportation facilities—rail, air and truck—are among the best. An already abundant supply of highly skilled labor is constantly mounting. Tax conditions in Ohio are favorable to industry and weather is pleasant even though it fluctuates from below zero to above the 100 mark.

From the results of Business Week's poll and the great industrial growth Ohio is experiencing, the day must surely come when Ohio is the No. 1 industrial state in the nation.

**NEARNESS TO MARKETS:** You can easily reach *the people you buy from* and *the people you sell to* when your business or industry is located in Ohio . . . center of the nation's richest markets.

**AVAILABLE LABOR SUPPLY:** Ohio plants draw on a large, highly-skilled labor pool. Ohio leads in a broadened program of technical education.

**REASONABLE TAXES:** Ohio business taxes are lower than in many industrial states. Ohio's state and local governments welcome new industry and help it succeed.

**ABUNDANT RAW MATERIALS & UTILITY SERVICES:** Ohio plants profit from ready access to water, coal, iron ore, steel, natural gas, electricity, rubber, chemicals, atomic energy.

**GOOD TRANSPORTATION:** Modern rail, air and trucking facilities serve every section of Ohio. Low-cost water transportation links Ohio with 32 states and all overseas markets.

***FOR DETAILED INFORMATION** on available industrial sites or any aspect of plant location in Ohio, write or phone Division of Economic Development and Publicity, Ohio Dept. of Commerce, Columbus 15, Ohio.*

**(Editorial published in *Ohio State Journal*, Columbus, Ohio, December 13, 1958).**

*If you're looking to the future . . . locate in* OHIO

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## ADMINISTRATION

control district in the San Joaquin Valley.

•

**Wisconsin Price-Fixing:** Wisconsin's attorney general said last week he will appeal a state circuit court (Milwaukee) ruling dismissing the state's antitrust charges against three chemical companies.

Dismissed were price-fixing charges against Dow Chemical Co., Columbia-Southern Chemical Corp. and Wyandotte Chemicals Corp. (Similar charges are still pending against Allied Chemical Corp. and Pittsburgh Plate Glass.) The firms had moved for dismissal on grounds that the Federal Trade Commission entered the price-fixing investigation first, pre-empting state jurisdiction. FTC issued desist orders against the firms in '38, has been checking on compliance since then.

The state attorney general's office charged the companies with agreeing on a price for calcium chloride, submitting identical bids to municipalities. Announcing the appeal, the attorney general said, "The importance of maintaining state jurisdiction to enforce its antitrust laws is so great that I feel compelled to appeal . . . on the question of whether FTC enforcement takes precedence over state laws."

## KEY CHANGES

**Edwin C. McDonald** and **Maxwell W. Mackenzie** to directors, Celanese Corp. of America (New York).

**Sam DuPree** to director, Goodyear Tire & Rubber Co. (Akron, O.).

**Laurent Oppenheim, Jr.,** to director and vice-president, finance, Hanson-Van Winkle-Munning Co. (Matawan, N.J.).

**Hubbard S. Caven** and **Nelson Myers** to vice-presidents, Texas Gulf Sulphur Co. (Houston, Tex.).

**James W. Swaine** to vice-president, General Chemical Division, Allied Chemical Corp. (New York).

**Samuel A. McCain** to vice-president, Corn Products Co. (New York).

**Roy T. Omundson** to vice-president, Chemetron Corp. (Chicago).

**John B. Alexander** to vice-president and chemical director, Southwestern Portland Cement Co. (Los Angeles).


# Tracers

TO THE CHEMICAL PROCESS INDUSTRIES

*ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.*
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### POSITIONS VACANT

***Salesman—An old established Philadelphia*** chemical specialty company has an excellent opening for a thoroughly experienced salesman for contract packaging and private label trade. Must be able to offer unquestionable references from previous employers. Apply by letter only: C. P. Baker & Co., 501 N. Eleventh St., Philadelphia 23, Pa.

***Chemist Wanted for supervising paint laboratory*** of medium size Eastern manufacturer making complete line of chemical-resistant coatings; 2-3 years' experience in paint laboratory required. Time available for development work. Excellent opportunity for advancement. Send resume including photo, and indicate salary desired. P-1099, Chemical Week.

***Project Engineering Coordinator. A midwest*** chemical company desires to hire graduate chemical engineer with broad experience in project, design and process engineering in the petro-chemical field. Must have ability and experience in supervision and coordination of project activities including personnel involved. Our employees have been advised of this opening. Please send detailed resumé of personal data, experience, education, and present salary to P-1073, Chemical Week.

### SELLING OPPORTUNITY AVAILABLE

***Salesmen Industrial Chemicals—Our growth*** company continues to need additional salesmen to sell Water Treating and Petroleum Treating chemicals in our rapidly expanding markets throughout the U.S.A. Good salary plus expenses, profit sharing, and excellent benefit program. Car furnished. On-the-job training program. Two years of college chemistry and a college degree desirable. Industrial Sales experience an asset. Mail resume to Personnel Dept., National Aluminate Corporation, 6214 W. 66th Place, Chicago 38, Illinois.

### POSITIONS WANTED

***Sales Engineer Processing Equipment Experience*** desires sales-service position with manufacturer's agent-representative. Request details. PW-9968, Chemical Week.

***Plant Manager Ch.E. 18 years experience in*** production supervision and research. Last six as Plant Manager of 250 operators and 5 supervisory chemists in manufacture of azo dyestuffs and intermediates. Detailed process knowledge and many chemical improvements in dyestuff chemistry. Available and will relocate. PW-1024, Chemical Week.

***Manager Chem. Sales & Market Development*** 9 yrs. product and sales management. Dramatic results in expanding sales. Organized new chem. div. Have developed new national markets for variety of products. B.S.1939. PW-1072, Chemical Week.

***Chemist: bright, ambitious, resourceful, seeks*** employer desiring same. Opportunity paramount. PW-1066, Chemical Week.

### CONTRACT WORK AVAILABLE

***Wanted-Fee-basis chemical blending capacity*** sought by established speciality compounder. Rental of unused plant and equipment, a possibility. Liquid, paste and dry mix types needed. Cite operational details of equipment available. CWA-1096, Chemical Week.

### CONTRACT WORK WANTED

***Custom Grinding-Ultra Fine or Coarse-Specialty*** or Volume Blending and Grinding service on unit or contract basis. Complete $CO^2$ installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Corp., 10881 S. Central Avenue, Box 682 Oak Lawn, Illinois.

### MANAGEMENT SERVICE

***Aries Associates, Inc.—Technical and Economic*** Consultants to the Chemical Industry. New Products & Processes, Technical & Economic Studies. Design and Initial Operation of Complete Plants. Process Analysis-Market Research, 77 South St., Stamford, Conn. DA 5-2236.

### BUSINESS OPPORTUNITY

***French Chemical Company possessing Chemical*** and Plastics Plants offers: Disposal of a plant in France near Mediterranean harbour with railway connection, pipe-line to harbour, energy, workshops, office and lodging facilities, for utilization by an American Company for heavy products or proposes: to an American firm, chemicals manufacture in "joint venture" or in any other form of cooperation; possible diffusion by our Commercial Organization, if necessary. Projects will be confidentially examined. For supplementary information contact: French American Business Services, 750 Third Avenue, 34th floor, New York 17, N.Y.

### PLANTS & PROPERTIES

***For Sale At 1/3 Cost, Oil Storage And Blending*** Plant. Also Suitable For Chemical Concern. Located in New Jersey within free Lighterage Limits New York Harbor. 2 acre plant, water front property, currently in operation, containing 21 bulk storage tanks totalling approx. 2,000,000 gals. cap; 2 story brick office building and complete laboratory (equipped for air-conditioning); four large storage buildings; enclosed dock; 15 steam jacketed blending tanks; Bowser Homogenizer; elaborate conveyor system; automatic drum and can filling equipment; automatic carton sealing machine; private railroad siding; excellent trucking facilities. Early possession arranged. Write, in confidence, to: FS-1077, Chemical Week.

### FOR SALE

***Allis-Chalmers 7' x 50' Rotary Dryer, Double*** shell, indirect-direct heat. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

***Baker-Perkins 100 Gal. Dispersion Blade Mixer,*** stainless steel, jktd., vacuum, 75 HP. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

***Free Catalog! Fort Pitt Brewery, Pittsburgh*** - 16-page, 2-color illustrated catalog showing all the processing equipment in this plant, which ceased operations in November. Thousands of dollars worth of equipment being sold piecemeal for a mere fraction for immediate delivery. Write to: Chas. S. Jacobowitz Corp., 3082 Main St., Buffalo 14, N.Y. Phone: AMherst 2100.

***Expanded Perlite Powder. Finely divided white*** siliceous inorganic powder packed in 4 cu. ft. 50 lb. paper bags. Used as filler and extender in coatings, insecticides, ceramics and plastics. Priced $50. per ton f.o.b. Nashville, Tennessee. For samples and information write Sales Manager, Chemical Division, Tennessee Products & Chemical Corporation, P. O. Box 9, Nashville 2, Tennessee.

***Pyrex Pipe And Fittings—Stock from 1 to 4"*** Dia. J. N. Jacques—131 W. Lexington Blvd.—Milwaukee 17, Wis.

***Reactor T347 S.S. New 4000 gal. jktd. 150#*** int. press. ASME. Used good cond. 1500 gal. Pfaudler glass lined agit. jktd. Reactor 50# int. press. 90# jkt. press. 15 HP XP motor. Located southwest. FS-1097, Chemical Week.

***Stainless Filter—Vertical leaf diatomaceous*** earth filter, 240 sq. ft. with feeder, immediate delivery. FS-1027, Chemical Week.

***Tanks—The Largest inventory of glass-lined*** tanks anywhere. Write for free listings, no obligation, immediate delivery, priced half of new. What do you need? Jacobowitz, 3082 Main St., Buffalo 14, N. Y.

***Tank Trailers for Chemicals Stainless Steel—*** new and used. Hackett Tank Co., Inc. P.O. Box 803, Packers Sta., Kansas City, Kas. MA 1-2363.

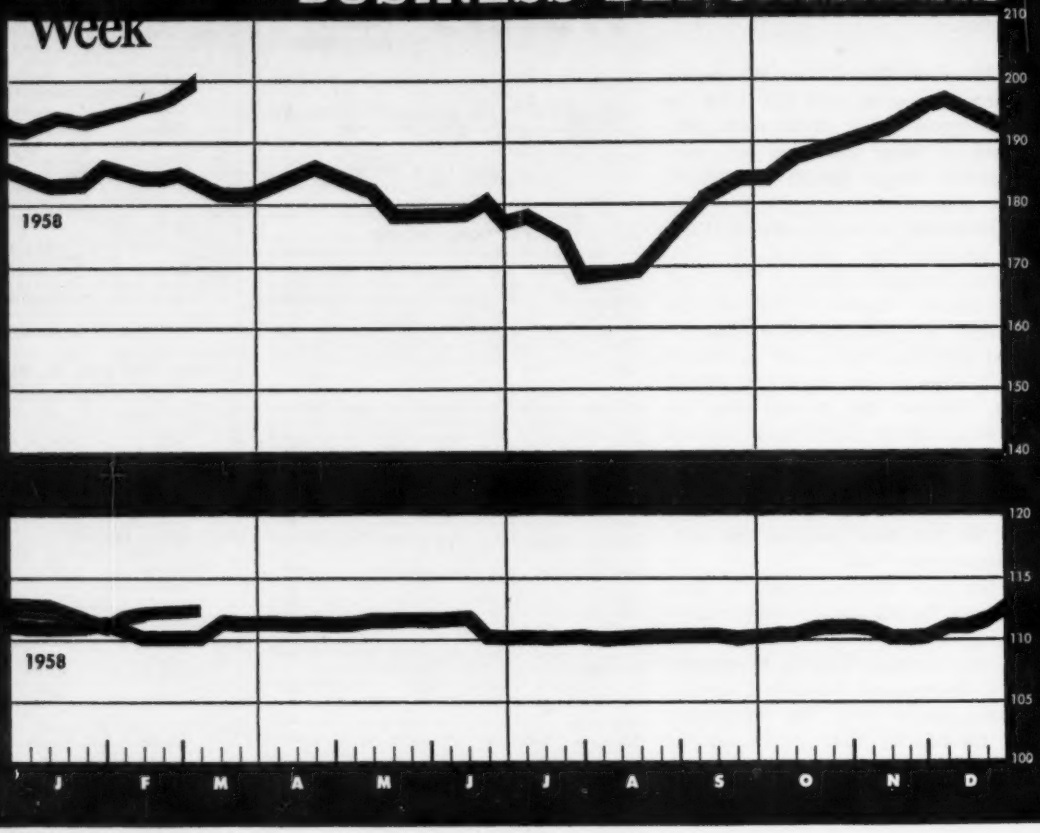
### WANTED

***Plans for small caustic soda plant.*** Quote costs for plan in reply. W-1071, Chemical Week.

### WANTED/FOR SALE

***This Tracer Section can be used whenever you*** are looking for or offering Equipment, Plants, Supplies, Chemicals, Opportunities, Special Services. The rates are low—just call or write Classified Advertising Division, Chemical Week, P.O. Box 12, N. Y. 36, N. Y., LOngacre 4-3000.

# BUSINESS BENCHMARKS

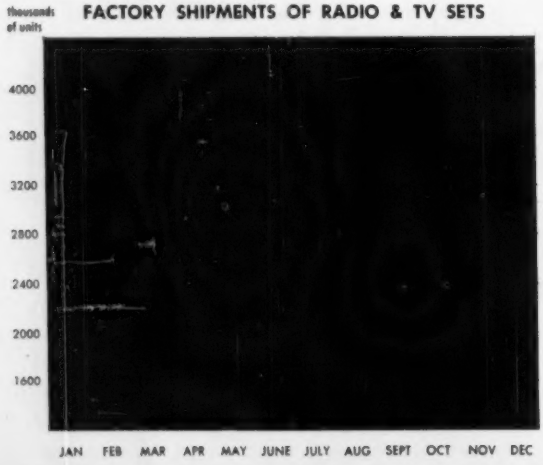



**MARCH 7, 1959**

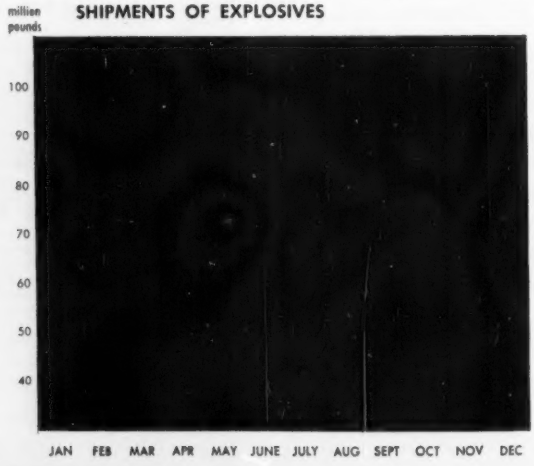
| WEEKLY BUSINESS INDICATORS | Latest Week | Preceding Week | Year Ago |
|---|---|---|---|
| Chemical Week output index (1947-1949=100) | 200.5 | 199.0 | 182.0 |
| Chemical Week wholesale price index (1947=100) | 111.9 | 111.9 | 111.0 |
| Stock price index (11 firms, Standard & Poor's) | 51.31 | 49.68 | 48.71 |
| Steel ingot output (thousand tons) | 2,481 | 2,449 | 1,475 |
| Electric power (million kilowatt-hours) | 13,259 | 13,156 | 12,338 |
| Crude oil and condensate (daily av., thousand bbls.) | 7,208 | 7,262 | 6,808 |

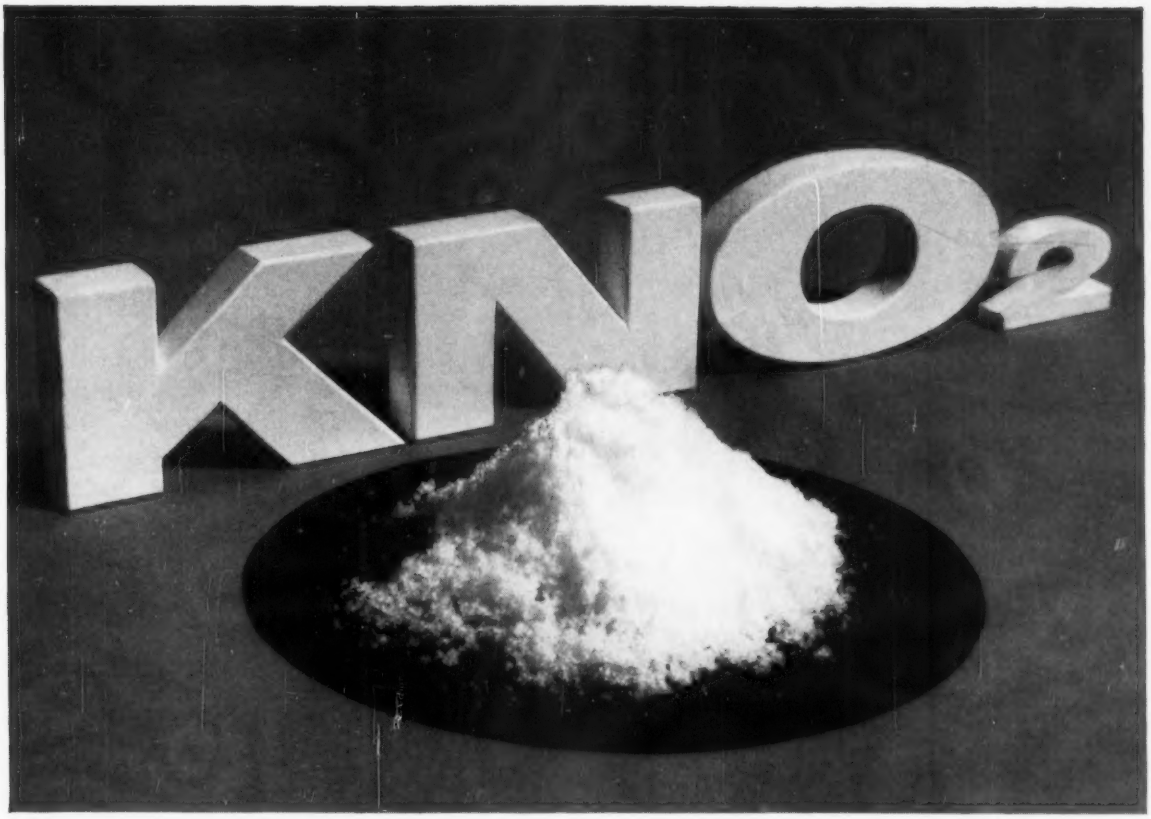
| **EMPLOYMENT** (production workers, thousands) | Latest Month | Preceding Month | Year Ago |
|---|---|---|---|
| All manufacturing | 11,812 | 11,946 | 12,024 |
| Nondurable goods | 5,098 | 5,197 | 5,155 |
| Chemicals and allied products | 514.7 | 516.5 | 525.3 |
| Paper and allied products | 439.8 | 443.1 | 444.8 |
| Rubber products | 199.5 | 198.4 | 200.9 |
| Petroleum and coal products | 152.8 | 155.3 | 161.0 |

**FACTORY SHIPMENTS OF RADIO & TV SETS**




**SHIPMENTS OF EXPLOSIVES**



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You can now obtain high purity potassium nitrite in carloads or truckloads from B&A®.

Perhaps its properties may meet a special requirement you've been trying to fill. Or you may want to apply it as others have—as a heat exchange medium or as a corrosion inhibitor.

Baker & Adamson offers two grades of potassium nitrite: Crystal Technical, in 200 lb. polyethylene-lined steel drums . . . Crystal Reagent, in 100 lb. polyethylene-lined drums.

Mail coupon for technical data, samples.

Allied Chemical

**GENERAL CHEMICAL DIVISION**
**40 Rector Street, New York 6, N. Y.**

**Physical and Chemical Properties:**

Appearance . . . . . white to cream-colored deliquescent small crystals

Molecular Weight . . . . . 85.11

Melting Point . . . . . 297°C

Decomposition starts slightly above the melting point.

Solubility: Very soluble in water and ammonium hydroxide; slightly soluble in alcohol.

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**Baker & Adamson® Fine Chemicals**
**GENERAL CHEMICAL DIVISION**
**ALLIED CHEMICAL CORPORATION**
**40 Rector Street, New York 6, N. Y.**

Please send: ☐ Technical data ☐ Samples CW-39

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This is a happy Durco sales manager. He is giving every series H. Durcopump user another plus feature that will increase bearing life and improve pump performance.

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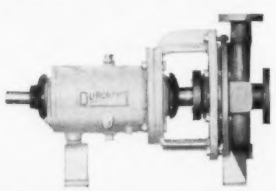

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